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IT IN SUPPLY CHAIN: BOOSTING OF PERFORMANCE IN INDIAN MANUFACTURING

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ABSTRACT

In today's globalized and competitive market, companies face challenges such as uncertain demand and informed customers. To stay ahead, many firms are turning to Information Technology (IT) to strengthen their supply chains. This study examines how IT integration in the downstream supply chain affects a firm's competitive marketing performance. Using the resource-based view (RBV) as a framework, the research explores how IT capabilities—specifically IT advancement and IT alignment—enhance supply chain responsiveness and collaboration. These capabilities lead to both operational efficiencies and strategic marketing advantages, which ultimately improve competitive performance. The methodology involves a literature review and data collection to analyse the influence of IT-enabled processes. Findings reveal that targeted IT investments, when aligned with key supply chain functions, contribute significantly to marketing success. The study provides insights into how IT can be leveraged to gain a competitive edge in today's dynamic business environment.

Keywords: Resource Based View, Supply Chain Capabilities, IT Alignment, Strategic Advantage.

I. INTRODUCTION

1.1 Background

The increasing pace of globalization has intensified competition across industries, compelling businesses to adopt more efficient and responsive strategies. Information Technology (IT) has emerged as a key enabler in improving supply chain performance, particularly in the downstream segment where customer satisfaction and market responsiveness are crucial. Organizations are now integrating IT tools to enhance collaboration, streamline logistics, and respond quickly to market changes. This research focuses on how IT capabilities such as technological advancement and strategic alignment influence supply chain effectiveness and contribute to a firm's competitive marketing performance.

1.2 Problem Statement

Despite significant investments in IT, many firms struggle to demonstrate clear improvements in their marketing and operational outcomes. Traditional models often overlook the strategic role of IT in supply chains, especially when evaluating its direct impact on market performance. This study aims to address this gap by analyzing how specific IT factors influence supply chain capabilities—like responsiveness and collaboration—and how these, in turn, affect competitive marketing outcomes. It highlights the need for a comprehensive framework that connects IT investments to tangible performance improvements.

1.3 Objective

- To examine the role of IT advancement and alignment in enhancing supply chain capabilities.
- To evaluate the impact of supply chain responsiveness and collaboration on marketing performance.
- To identify the operational and strategic benefits derived from IT-enabled supply chain processes.
- To provide actionable insights for firms aiming to leverage IT for competitive advantage in marketing.

1.4 Hypotheses

- **H_0:** There is no significant relationship between IT capabilities and competitive marketing performance.
- **H_1:** There is a significant relationship between IT capabilities and competitive marketing performance.

II. LITREATURE REVIEW

2.1 Theoretical Framework: Resource-Based View (RBV)

The Resource-Based View (RBV) provides the foundation for understanding how internal resources, such as IT, contribute to sustained competitive advantage. According to RBV, resources must be valuable, rare, inimitable,

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and non-substitutable to generate strategic benefits. IT resources—such as infrastructure, software integration, and alignment with business goals—fit within this framework when effectively deployed. Several studies have shown that firms with well-integrated IT systems can develop distinctive capabilities that enhance performance across supply chain and marketing functions.

2.2 IT Capabilities and Supply Chain Responsiveness

IT capabilities in the supply chain enable real-time data sharing, forecasting, inventory management, and demand planning. Downstream supply chain responsiveness—referring to a firm's ability to quickly react to changes in customer demand—is greatly improved through advanced IT tools. Research suggests that IT-enabled supply chains are more agile and better positioned to serve fluctuating customer needs, leading to improved service quality and reduced lead times.

2.3 IT Alignment and Collaboration

Strategic IT alignment ensures that technology investments support broader business and marketing goals. Collaborative technologies such as cloud platforms, ERP systems, and customer relationship management (CRM) tools foster better communication between partners, suppliers, and customers. Literature indicates that firms with strong IT-business alignment experience higher levels of trust and cooperation, which enhance marketing flexibility and customer loyalty.

2.4 Impact on Competitive Marketing Performance

Studies have highlighted those operational improvements driven by IT—such as cost efficiency, reliability, and delivery speed—translate into marketing benefits like increased customer satisfaction, retention, and market share. Competitive marketing performance is closely linked to a firm's ability to align IT with strategic marketing objectives, emphasizing customer-centric innovations, timely communication, and personalized services.

2.5 Research Gap Identified

Although various studies confirm the positive impact of IT on supply chain and marketing outcomes, few have focused specifically on the downstream supply chain and its direct influence on marketing performance. Additionally, most models emphasize operational efficiency without fully exploring strategic marketing benefits. This research aims to bridge these gaps by examining how IT resources shape supply chain responsiveness and collaboration, leading to measurable marketing advantages.

III. RESEARCH METHODOLOGY

3.1 Objective of the Study

- To analyse whether the use of advanced IT and IT alignment with channel members impacts logistics and supply chain capabilities.
- To review literature on supply chain systems in order to identify existing gaps using information technology.
- To test and validate the IT-based SCM system.
- To establish user and system requirements for logistic and supply chain systems based on findings.
- To identify the role of IT in logistics and supply chain management in the Indian scenario.

3.2 Scope of the Study

There is currently limited research in the area of IT in SCM in India. While Indian manufacturing companies have made significant investments in IT to streamline supply chain operations, the performance outcomes of such investments remain underexplored. This study addresses that gap by empirically evaluating the impact of IT on the downstream supply chain within Indian manufacturing firms. The dependent variables considered are operational and strategic marketing benefits, while the key outcome variable is competitive marketing performance. The independent variables include IT use, IT advancement, IT alignment, and supply chain capabilities. This study targets the usage and deployment of IT tools and practices in SCM across Indian manufacturing companies, offering strategic insights based on real-time data.

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3.3 Research Approach

Following Kothari's (2004) definition, this study adopts a qualitative research methodology. Qualitative research is apt for exploring behavioural and operational insights that cannot be quantified directly. It involves collecting and analysing data through interpretive means.

Key aspects of qualitative research:

- Seeking meaning in social contexts
- Using flexible methods to maintain direct contact with subjects
- Producing rich, detailed qualitative findings

3.4 Research Philosophy

This research is guided by the following philosophical foundations:

1. A search for contextual meaning
2. Flexible and adaptive data collection strategies
3. Interpretation-driven qualitative analysis

3.5 Research Design

As per Mariampoliski (2001), qualitative methods are suitable for understanding strategic behaviour, ideation, and culturally influenced preferences. This study employs qualitative research tools such as interviews and literature reviews to gather data related to IT and SCM.

The flexible nature of qualitative research allows for adaptive questioning, ensuring that deeper insights into organizational practices are captured.

3.6 Data Collection

Effective data collection is central to generating reliable research output. This study uses both primary and secondary data sources.

3.6.1 Types of data

- **Primary Data:** Collected through structured surveys and interviews with supply chain managers in Indian manufacturing companies.
- **Secondary Data:** Derived from published books, journal articles, websites, and industry report relevant to SCM and IT.

3.6.2 Methods of Data Collection

Primary data was collected through:

- Surveys
- Interviews

Secondary data was gathered from:

- Books, journals, whitepapers
- Online databases and government reports

Factors influencing method selection:

- Nature and scope of enquiry
- Budget and time availability
- Required precision level

Details:

- **Sample Size:** 150 respondents
- **Sampling Method:** Random sampling
- **Research Instrument:** Questionnaire (includes both open-ended and close-ended questions)
- **Statistical Tools Used:** Simple percentage analysis, pie charts, and bar graphs

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Table 1:

Sr. No.	Category	No. of Respondents	Percentage
1	Distribution / logistics	45	30
2	Marketing / Sales	25	17
3	Supply Chain	35	23
4	Manufacturing	20	13
5	Operations	15	10
6	Administration / HR / Corporate	10	7
		150	**100**

3.6.3 Simple Percentage analysis

Key Statistical Metrics:

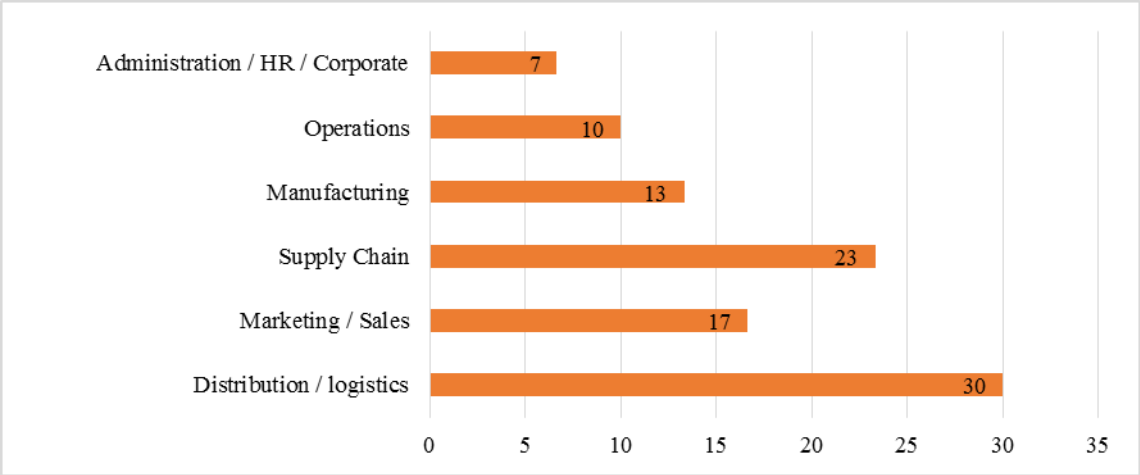
- **Mean** (Average): 25.0
- **Median**: 22.5
- **Mode**: 45 (Distribution / Logistics)
- **Minimum**: 10 (Administration / HR / Corporate)
- **Maximum**: 45 (Distribution / Logistics)
- **Range**: 35
- **Standard Deviation** (σ): ≈ 12.25
- **Variance** (σ^2): ≈ 150.42

This analysis supports the reliability of the collected data and the representativeness of the surveyed population.

IV. RESULTS AND DISCUSSION

4.1 Key Finding

Graph 1: [Job area of respondents]



Graph 1:

Interpretation

30% of the respondents were from the distribution/logistics function. Managers working in Marketing/Sales were 17% of the respondents. 23% of the respondents belonged to the supply chain area, 13% belonged to the manufacturing area and 10% to the Operations area. 7% of the respondents were from corporate office from across the functions.

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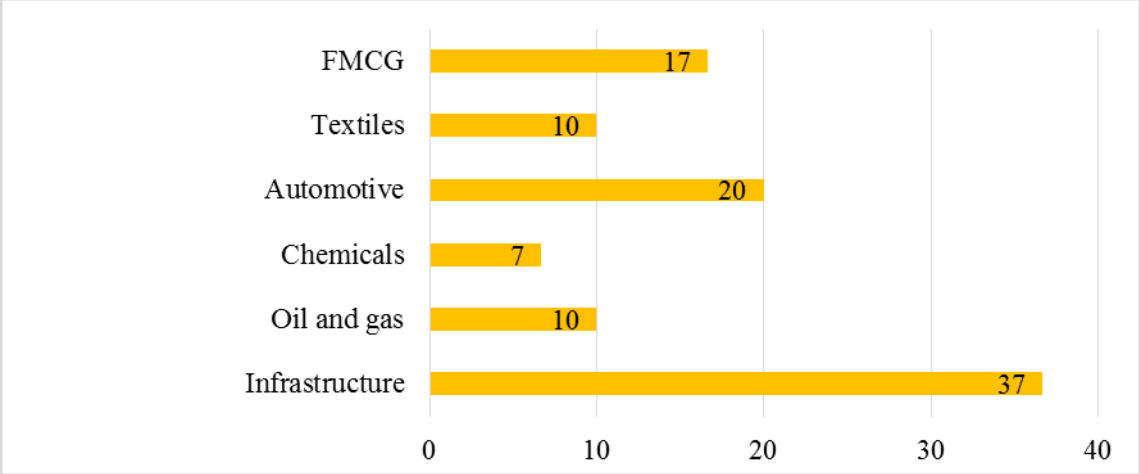


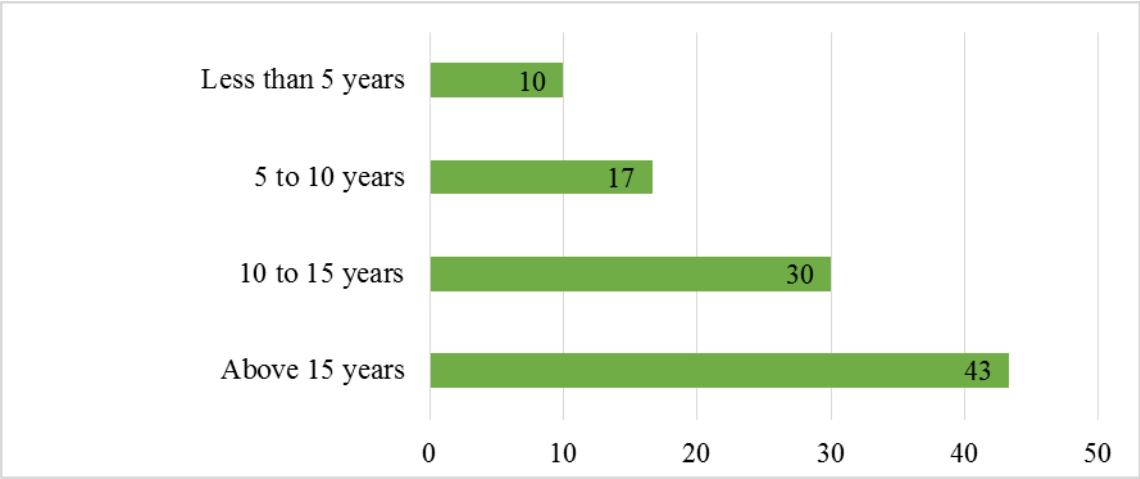
Graph 2: [Industry Classification]

Interpretation

37% of the respondents belongs to infrastructure industry, 10% of the respondents belongs to oil and gas industry, 7% of the respondents belongs to chemical industry, 20% of the respondents belongs to automotive industry, 10% of the respondents belongs to textile industry and 17% of the respondents belongs to FMCG industry,

Table 2: [Work experience of respondents]

Sr. No.	Category	No. of Respondents	Percentage
1	Above 15 years	65	43
2	10 to 15 years	45	30
3	5 to 10 years	25	17
4	Less than 5 years	15	10
		150	**100**



Graph 3: [Work experience of respondents]

Interpretation

43% of the respondents have indicated that they have been with the organization over 15 years, 30% have indicated that they have worked between 10 to 15 years and 17% state they have been employed by the organization for 5 to 10 years. Managers with work experience of less than 5 years form only 10% of the sample respondents.

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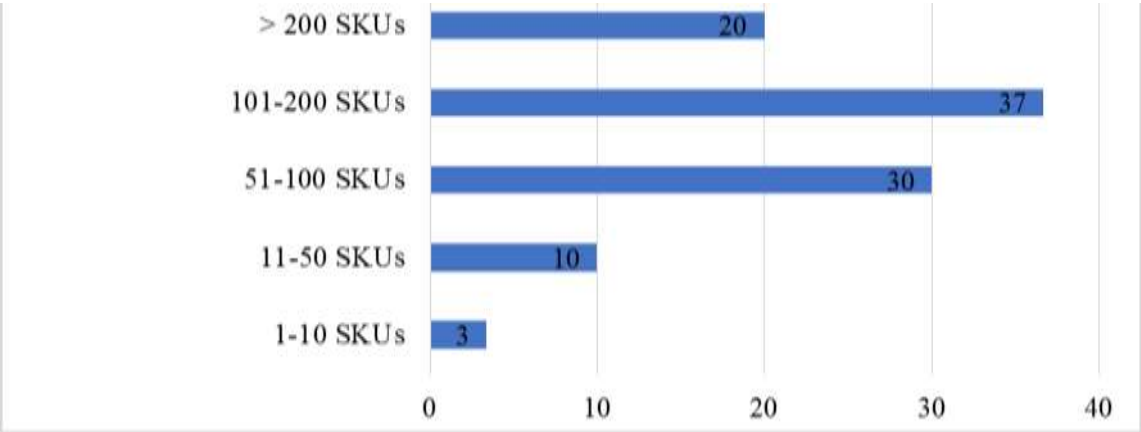
Table 3: [Number of Stock keeping units (SKUs) handled]

Sr. No.	Category	No. of Respondents	Percentage
1	1-10 SKUs	5	3
2	11-50 SKUs	15	10
3	51-100 SKUs	45	30
4	101-200 SKUs	55	37
5	> 200 SKUs	30	20
		150	**100**



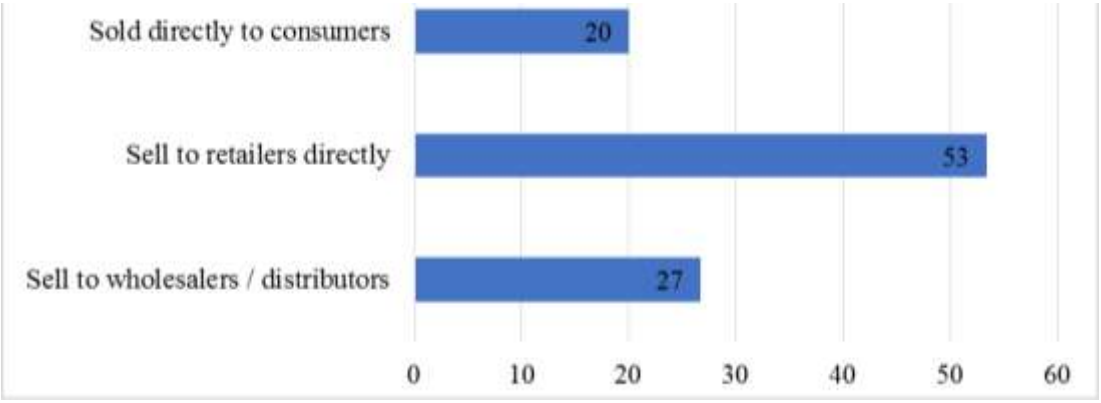
Graph 4: [Number of Stock Keeping units (SKUs) handled]

Interpretation

The respondents had indicated the number of stocks keeping units they carried. 3% of the respondents had to maintain inventory of 1-10 SKUs, another 10% had 11-50 SKUs, 30% carried 51-100 SKUs, 37% had 101-200 SKUs and 20% had more than 200 SKUs to be managed.

Table 4: [Distribution channels used to send finish product to consumers]

Sr. No.	Category	No. of Respondents	Percentage
1	Sell to wholesalers / distributors	40	27
2	Sell to retailers directly	80	53
3	Sold directly to consumers	30	20
		150	**100**



Graph 5: [Distribution channels used to send finish product to consumers]

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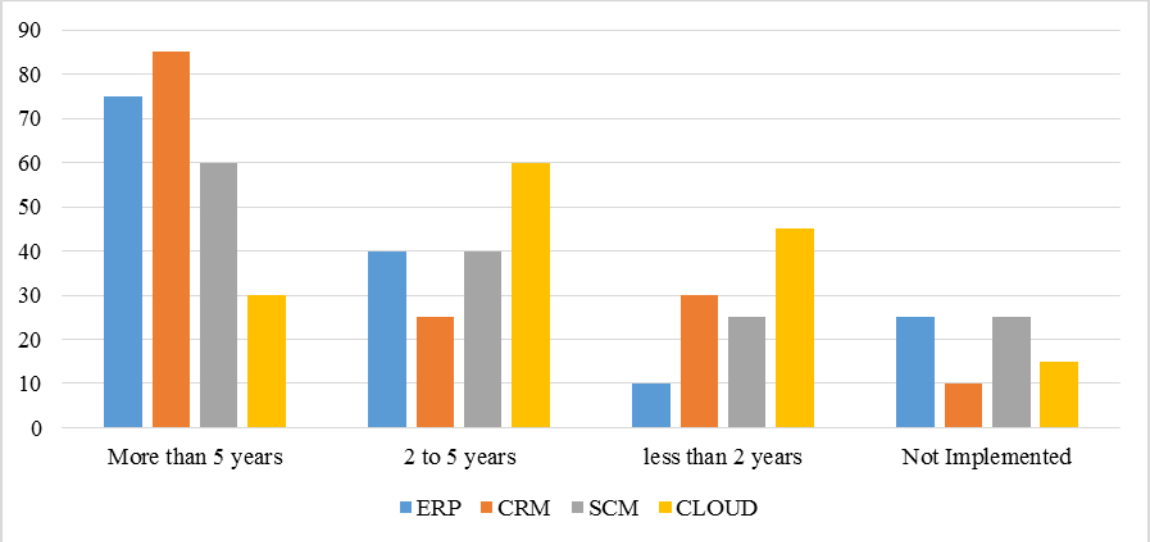
Interpretation

27% respondents said that they deal through wholesalers/distributors and 53% have said they sell to retailers directly. And 20% sold directly to consumers.

Table 5: Usage of Information Technology in the organization

IT Application	More than 5 years	2 to 5 years	less than 2 years	Not Implemented	Total
ERP	75	40	10	25	150
CRM	85	25	30	10	150
SCM	60	40	25	25	150
CLOUD	30	60	45	15	150



Graph 6: [Usage of Information Technology in the organization]

Interpretation

The respondents have indicated their years of implementation of four key software viz. ERP, CRM, SCM and CLOUD with their branch offices. 75% respondents indicated they have implemented ERP for more than 5 years, 85 have implemented CRM for more than 5 years, 60% have implemented SCM for more than 3 years and 30% have implemented CLOUD with their branch offices.

Table 6: [IT Objective in SCM and Logistic Operation]

Sr. No.	Category	Agree Count	Agree %	Not Agree Count	Not Agree %	Total
1	Better demand visibility	70	47	80	53	150
2	Increase demand forecast accuracy	95	63	55	37	150
3	Reduce inventories	100	67	50	33	150
4	Increase customer satisfaction	80	53	60	40	140
5	Reduce supply chain costs	110	73	40	27	150
6	Increase efficiency of people and processes	125	83	25	17	150

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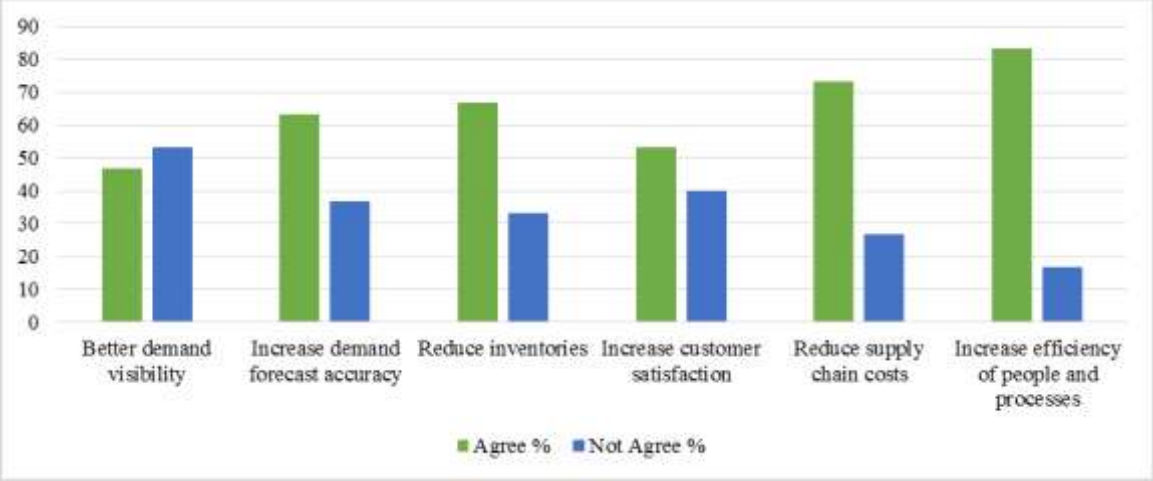

Graph 7: [IT Objective in SCM and Logistic Operation]

Interpretation

47% respondents agreed that IT helps better demand visibility, 63% respondents agreed that IT Increase demand forecast accuracy, 67% respondents agreed that IT helps to reduce inventories, 53% respondents agreed that IT helps to increase customer satisfaction, 73% respondents agreed that IT helps to reduce supply chain costs.

V. LIMITATIONS

This study encountered several limitations that should be acknowledged:

- **Limited Sample Size:** Due to a small number of observations, advanced model validation techniques—such as split-run testing or holdout samples—could not be employed. Future research should address this through broader sampling.
- **Time and Resource Constraints:** The data collection process was restricted by limited time and resources, affecting the depth and scope of responses.
- **Low Response Rate:** The effective response rate was minimal. Efforts such as follow-up calls, emails, and in-person outreach were required to enhance participation. A higher response rate in future studies would improve the robustness of findings.
- **Dependence on Top Management Support:** Organizational responses were difficult to secure without top-level approval. Future studies should ensure management backing to increase participation.
- **Single-Function Respondent Bias:** The study primarily involved individuals from marketing, sales, logistics, and operations. Since SCM spans multiple domains, insights from a single function may not provide a holistic view, potentially affecting the accuracy of strategic responses.
- **Industry Limitation:** The focus was confined to the manufacturing sector, which may restrict the generalizability of findings to other sectors like services. Future studies could replicate the model across industries to broaden applicability.

VI. CONCLUSION

The study emphasizes that strong supply chain capabilities—like coordination and real-time information sharing—boost marketing performance and competitive advantage. Though complex, implementing IT systems in the supply chain leads to faster decisions and better customer satisfaction. The research also provides validated tools for measuring IT impact and confirms that IT enhances logistics performance in Indian manufacturing firms. It sets a foundation for future studies on IT's role in downstream supply chain success.

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