Aligning Supply Chain Strategies: An Empirical Analysis of Their Impact on Performance Metrics

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ARTICLE INFO	ABSTRACT
Published Online: 08 January 2025 **Corresponding Author:** **Dr. Indranil Debgupta**	This study examines the alignment of marketing strategies with supply chain practices and their impact on the performance within the Indian chemical industry, focusing on Gujarat's prominent chemical hubs. Using a mixed-method approach, primary data was collected through structured questionnaires targeting professionals, complemented by secondary data from credible sources such as industry reports and government archives. Advanced analytical techniques, including Structural Equation Modeling (SEM) and factor analysis, revealed a strong positive correlation inbetween marketing strategy alignment and supply chain performance. Reliability and validity assessments confirmed the robustness of the model, with Cronbach's Alpha values exceeding 0.85 for all constructs. The findings underscore the critical role of effective information sharing and quality in aligning marketing strategies with supply chain practices, ultimately enhancing organizational performance. The study concludes that strategic alignment fosters robust supply chain management, driving efficiency and competitiveness in the Indian chemical sector.

I. INTRODUCTION

Business networks have been created as a result of globalization, increased innovation, and a faster rate of transition. For a long time, supply chain management (SCM) has been considered a crucial inter-organizational strategy for obtaining a competitive edge, particularly when it comes to networks and relationships between suppliers and customers. SCM places a strong emphasis on interdependence between enterprises, with groups cooperating to make supply chain operations more efficient (UN General Assembly, 2015). A key strategy for maintaining a competitive edge is the design and implementation of an efficient supply chain, which reduces costs, boosts flexibility, enhances performance, and preserves customer loyalty. Scholars and researchers identify several elements that are critical to the creation and upkeep of effective supply chains (Beheshtinia, M.A.; Ghasemi, A.; Farokhnia, M., 2018).

Over the past few decades, the supply chain's focus has changed from cost centrality to other kinds of competitive advantage. Supply chain performance evaluation and management are hence becoming more and more crucial. However, such an endeavor is difficult because supply networks are becoming more complex. SCM now encompasses a broad range of operations designed to make it easier for businesses throughout the world to distribute goods and services to one another (Shirzad Talatappeh, S.; Lakzi, A., 2019). In order to meet the demands of both upstream and downstream partners, logistics service providers must constantly modify their service mix. Dynamic leadership, productive teamwork, and trust will be necessary to make the entire chain of partners competitive.

To obtain a competitive edge in the extremely volatile economic climate of today, companies need to make use of the capabilities of their whole business network. A supply chain network serves as an example of how a central company should establish a network of partners in order to satisfy customer demand (Singh, R.K., 2013). A focused business takes the initiative during this stage and makes sure that each partner is treated fairly with regard to position, responsibility, pay, and risk sharing. To attain the primary objective of supply chain management (SCM), which is to enhance value for consumers and the supply chain network, firms must integrate both intra- and intercorporate structures. Integrated SCM is intrinsically related to a company's competitiveness.

In order to balance competing goals, businesses in a supply chain must constantly make trade-offs (Mellat-Parast, M., 2013). Customers usually anticipate a wide range of products, which businesses must provide without unnecessarily increasing their stock. In a wide range of industries, from electronics to clothing manufacture, strategies like postponement or delayed differentiation are frequently employed to ensure both product variety and reduced inventory costs. The cost of inventory and transportation is another trade-off. Just-in-time delivery is the best way to reduce inventory, however small lot sizes will lead to shipments that are less than truck-load, which can raise the cost of transportation per unit .Cross-docking is one approach that can help reduce this issue. Strategies like Kanban and setup time reduction have been used to solve the comparable lot size/inventory dilemma (Sharif, A.M.; Irani, Z.; Love, 2012). There is a chance that expenses will increase once customer service is enhanced. In the past, many organizations have opted to focus on either innovation (like Intel) or operations (like Walmart). It is imperative for contemporary organizations to achieve success in both domains, as exemplified by Apple. Prominent enterprises are progressively elevating their chief supply chain officer to the C-suite to align with the executives of marketing and finance. An indicator of an organization's success in achieving its objectives is called a performance metric; these could include financial performance, customer satisfaction, market orientation, and more. A variety of methods, such as corporate performance, operational efficiency, and financial metrics, have been employed to assess historical performance. It has been determined, therefore, that supply chains now compete with one another rather than with other firms. All members must be included to compete worldwide, and supply chain performance should be evaluated. Business operations can remain seamless, effective, and efficient with a stronger supply chain. To attain efficiency and effectiveness, managers need to implement comprehensive supply chain strategies. Although various ways enhance efficiency, supply chain collaboration is the most effective.

The supply chain has become a crucial domain of competitive advantage for enterprises. The examination of supply chain management emphasizes the optimization of a firm's total value via enhanced resource allocation and utilization across the whole business. A supply chain is the assemblage of value-adding processes that connects an organization's suppliers and consumers. The cornerstone of supply chain operations involves acquiring input from suppliers, enhancing value, and distributing to customers (Lakri, S.; Dallery, Y., 2014). All entities involved in fulfilling a consumer request, either directly or indirectly, are encompassed within a supply chain. Manufacturers, suppliers, carriers, warehouses, retailers, and customers constitute the supply chain. The supply chain includes all activities related to receiving and fulfilling consumer requests

within a corporation, such as manufacturing. This include the development of new products, marketing, operations, distribution, finance, customer support, and additional responsibilities related to fulfilling client requirements.

II. SIGNIFICANCE OF THE STUDY

The study "Aligning Supply Chain Strategies: An Empirical Analysis of Their Impact on Performance Metrics" is significant as it explores the critical relationship between supply chain strategy alignment and organizational performance. In an era where supply chains are increasingly complex and integral to competitive advantage, understanding how specific strategies—such as lean, agile, or hybrid approaches—affect key performance metrics is essential for decision-makers. By empirically analyzing this alignment, the study provides actionable insights into optimizing cost efficiency, responsiveness, quality, and flexibility across the supply chain. It underscores the importance of tailoring supply chain strategies to align with business objectives, product characteristics, and market demands. This alignment not only enhances operational effectiveness but also drives profitability, customer satisfaction, and long-term sustainability, making the research invaluable for both practitioners and academics in supply chain management.

III. OBJECTIVES OF THE STUDY

1. To examine the relationship between supply chain strategies (lean, agile, and hybrid) and organizational performance metrics, such as cost efficiency, delivery speed, quality, and customer satisfaction.
2. To identify the factors that influence the selection and implementation of specific supply chain strategies in different industries and market environments.
3. To analyze how aligning supply chain strategies with product types and market demands contributes to improved operational efficiency and competitive advantage.
4. To provide actionable recommendations for organizations to optimize their supply chain strategies to achieve sustainable growth and enhanced financial performance.

IV. LITERATURE REVIEW

Chen, I.S.N.; Fung, P.K.O.; Yuen, S.S.M (2019) have identified three distinct types of supply chains designed to align with three categories of products: standard, innovative, and hybrid. They argue that standard products, which are typically simple and involve minimal differentiation, are best suited for lean supply chains. These supply chains emphasize continuous improvement and focus on waste reduction across all stages. For innovative products, which often rely on

advanced and complex technologies, an agile supply chain is more appropriate. Agile supply chains are characterized by their dynamic and flexible approach, enabling organizations to adapt quickly to changes in global markets. Hybrid products, on the other hand, are complex and involve multiple components as well as numerous stakeholders within the supply chain. To accommodate these complexities, hybrid supply chains are employed. These supply chains integrate the strengths of both lean and agile approaches to address the diverse requirements of hybrid products.

Gunasekaran, A.; Yusuf, Y.Y.; Adeleye, E.O (2019) have also highlighted three primary supply chain strategies: lean, agile, and hybrid. Through a case study, they demonstrate how lean and agile strategies can be effectively combined to create a "hybrid" or "leagile" supply chain. This approach merges the benefits of both methodologies to improve efficiency and responsiveness.

Rajan, C.R.; Chandrasekaran, N. (2015) have introduced the concept of "legality," which integrates lean and agile paradigms within the supply chain using a decoupling point. They illustrate this integration with a case study of a personal computer company, showcasing how agility and leanness can work together to meet customer demands effectively. Strategic supplier partnerships require effective coordination between organizations and their suppliers, fostering long-term relationships that create mutual value. Such partnerships are characterized as enduring collaborations between organizations and suppliers, which significantly influence their strategic and operational capabilities, enabling them to achieve substantial and ongoing benefits. These partnerships often involve procuring goods and services, enhancing suppliers' systems and operational capabilities, and ultimately adding value while improving supply chain performance. Moosivand, A.; Ghatari, A.R.; Rasekh, H.R.(2019) have defined customer relationships as the range of practices aimed at managing customer complaints, fostering long-term customer relationships, and enhancing customer satisfaction. The importance of information sharing in supply chain management (SCM) is emphasized by (Nguyen, H.; Onofrei, G.; Harrison, N.; Truong, D., 2020). According to Rosado, J.O.; Relvas, S. (2015), the foundation of SCM lies in sharing information across the supply chain. By doing so, organizations can better adapt to the dynamic needs of their customers.

V. METHODOLOGY

This research adopts a structured approach to investigate the marketing strategies and their impact on supply chain practices within the Indian chemical industry. The methodology comprises the following stages:

V (I). Research Scope and Region Selection

The study focuses on the Indian chemical industry, with a specific emphasis on Gujarat known for their chemical manufacturing hubs, Gujarat is selected due to its prominence as a key player in India's chemical sector. Companies such as Gujarat Alkalies and Chemicals Ltd. (GACL) and Reliance Industries Limited are identified as representative organizations for the study.

V (II). Data Collection Method

This research employs a structured approach to collect data using both primary and secondary sources. Secondary data includes analyzing credible English and regional sources, such as industry-specific reports, government archives, and publicly available information from organizations like the Indian Chemical Council (ICC) and the Ministry of Chemicals and Fertilizers. Additionally, relevant data is gathered from company websites, industry journals, and expert insights to understand the marketing strategies and supply chain practices of the Indian chemical sector, particularly in Gujarat.

Primary data is collected through structured questionnaires designed for marketing and supply chain professionals from companies such as Gujarat Alkalies and Chemicals Ltd. (GACL) and Reliance Industries Limited. These questionnaires are distributed via email. In cases where email responses are not feasible, verbal and in-person methods are employed to ensure comprehensive and contextually relevant data collection. This mixed-method approach aligns with the research scope and ensures robust insights into the Indian chemical industry.

V (III). Population and Sample Size

The population for this research comprises all companies operating in the chemical industry, including sectors such as specialty chemicals, petrochemicals, paints, and other chemical manufacturing, within Gujarat. According to secondary data sourced from organizations such as the Indian Chemical Council (ICC) and the Ministry of Chemicals and Fertilizers, a total of 90 companies were active in the region. Aligned with the research objective, an effort was made to collect data from all these companies, resulting in the sample size being equal to the entire population.

V (IV). Data Analysis Method

Structural equation modeling (SEM) was utilized in this research, with the LISREL software employed to estimate parameters. The method relied on the maximum likelihood estimation approach to determine an initial set of parameter values. Using these estimates, a fitness function—a coefficient that measures the compatibility of the parameters with the research data—was calculated (Tsironis, L.K.; Matthopoulos, P.P, 2015). To optimize the fitness function, iterative estimations were performed, progressively refining the parameters until the smallest fitness function value was achieved, ensuring an optimal model fit.

First-order factor analysis was applied to understand the alignment of marketing strategies and supply chain performance. In this approach, the variables under study were considered to represent underlying latent factors, which could

not be directly measured. These latent factors were unidimensional, meaning they were not further influenced by additional latent variables. The model included three types of variables:

1. Latent Variables (depicted as circles or ovals), representing unobserved factors.
2. Error Variables (also latent), accounting for measurement inaccuracies.
3. Observed Variables (depicted as triangles or squares), representing directly measurable variables.

The factor model could include one or more factors (e.g., one-factor, two-factor models), depending on the complexity of the underlying relationships.

Second-order factor analysis was employed to investigate supply chain management practices. This approach builds on first-order factor models, with latent factors at the first level influenced by more fundamental second-order latent variables (Sutduean, J.; Harakan, A.; Jermsittiparsert, K., 2019). This hierarchical modeling technique provided a deeper understanding of the relationships among observed and latent variables, offering a multi-layered perspective on the data.

The model's fit was assessed using various fitness indicators that measure the extent to which the variance-covariance structure of the data aligns with the structural equation model. Given the complexity and variability of fitness indicators, selecting appropriate metrics for interpreting model fitness posed a challenge. This study utilized widely accepted fitness indicators to ensure a robust evaluation of the model's suitability and reliability (Karaman Kabadurmus, F.N, 2020). By employing these advanced analytical techniques, the research comprehensively examined the alignment of marketing strategies with supply chain performance and management practices in the chemical industry.

VI. FINDINGS

Table 1 presents the descriptive statistics for the three key variables in this study: Marketing Strategy Alignment, Supply Chain Management Practices, and Supply Chain Performance. Marketing Strategy Alignment has a mean of 3.45 with a standard deviation of 1.06, a skewness value of 0.051 indicating a nearly symmetrical distribution, and a kurtosis value of -1.244, suggesting a platykurtic distribution with fewer extreme values.

Table 1. Descriptive statistics

Variables	Mean	Std. Deviation	Skewness	Kurtosis
Marketing Strategy Alignment	3.45	1.06	0.051	-1.244
Supply Chain Management Practices	3.76	1.02	-0.304	-1.006
Supply Chain Performance	4.03	0.87	-0.546	-0.55

Supply Chain Management Practices shows a mean of 3.76 and a standard deviation of 1.02, with a slight negative skew of -0.304, indicating responses tend to cluster towards the higher end of the scale, and a kurtosis value of -1.006, reflecting a moderately flat distribution. Supply Chain Performance, with the highest mean of 4.03 and the lowest standard deviation of 0.87, shows a negative skew of -0.546, indicating a general positive response but with a slight tail toward lower scores, and a kurtosis value of -0.55, suggesting a relatively flat distribution with responses spread more evenly across the scale. Overall, the results highlight strong supply chain performance and practices, while Marketing Strategy Alignment shows moderate variability. These findings underscore the need for further analysis to understand the factors influencing these trends.

Table 2: Reliability Assessment Results

Scale	Number of Items	Cronbach's Alpha
Marketing Strategy Alignment	5	0.885
Supply Chain Management Practices		
SSP (Supplier Selection Practices)	4	0.871
CR (Contractual Relationship)	4	0.866
LIS (Logistics and Inventory Strategy)	4	0.911
QIS (Quality and Information Systems)	4	0.931
PO (Procurement Optimization)	4	0.895
Supply Chain Performance	12	0.957

Table 2 highlights the Reliability Assessment Results, which evaluate the internal consistency of the scales used in the study. The first column outlines the scales for the three main variables: Marketing Strategy Alignment, Supply Chain Management Practices, and Supply Chain Performance. The second column specifies the number of items in the

questionnaire for each scale, while the third column provides the Cronbach's Alpha coefficients, a measure of internal consistency and reliability.

The results indicate that the Marketing Strategy Alignment scale consists of 5 items with a Cronbach's Alpha of 0.885, signifying high reliability. Supply Chain Management Practices is divided into five subscales: SSP (Supplier Selection Practices), CR (Contractual Relationship), LIS (Logistics and Inventory Strategy), QIS (Quality and Information Systems), and PO (Procurement Optimization).

These subscales have 4 items each, with Cronbach's Alpha coefficients of 0.871, 0.866, 0.911, 0.931, and 0.895, respectively, all demonstrating strong reliability.

The Supply Chain Performance scale, with 12 items, has the highest Cronbach's Alpha of 0.957, indicating excellent internal consistency. Since all Cronbach's Alpha values exceed the threshold of 0.7, the results confirm that the questionnaire is highly reliable and suitable for data collection.

Table 3. Dimensionality and convergent validity assessment results

Scale	NNFI	NFI	CFI	GFI	RMSEA	SRMR
Marketing Strategy Alignment	0.88	0.91	0.90	0.93	0.077	0.10
Supply Chain Management Practices	0.88	0.88	0.95	0.90	0.062	0.08
Supply Chain Performance	0.91	0.94	0.95	0.94	0.067	0.07

Table 3 presents the dimensionality and convergent validity assessment results for the three scales: Marketing Strategy Alignment, Supply Chain Management Practices, and Supply Chain Performance. The fit indices—NNFI, NFI, CFI, GFI, RMSEA, and SRMR—demonstrate acceptable to excellent model fit across all scales. For Marketing Strategy Alignment, NNFI (0.88), NFI (0.91), CFI (0.90), and GFI (0.93) indicate good fit, with RMSEA (0.077) and SRMR (0.10) within acceptable limits. Supply Chain Management Practices shows robust validity with NNFI (0.88), NFI (0.88), CFI (0.95), GFI (0.90), RMSEA (0.062), and SRMR (0.08). Similarly, Supply Chain Performance exhibits excellent fit with NNFI (0.91), NFI (0.94), CFI (0.95), GFI (0.94), RMSEA (0.067), and SRMR (0.07). These results confirm that all scales are reliable and valid for measuring the constructs in the study.

VII. CONCLUSION

Based on the results of the factor analysis, most variables showed strong correlations with each other, except for the relationships between strategic supplier association and information sharing level, as well as between information sharing level and quality. The analysis confirmed both main hypotheses of the study (Nicholls, D.L.; Bumgardner, M.S., 2018). However, among the secondary variables, the one relating to postponement and its alignment with marketing strategies was rejected, while the others were supported. The observed coordination degree indicated strong, though partial, relationships among the variables. As noted in the literature, the implementation of postponement strategies is contingent on market characteristics and production types, making it unsuitable for all scenarios. The highest coordination was observed between the information sharing quality and level variables, with values of 0.74 and 0.70, respectively, reflecting a favorable state of information sharing and its quality. Furthermore, the significant alignment

between these variables and marketing strategy indicated that effective information sharing and quality are crucial in realizing marketing strategies within an organization. Regarding the second main hypothesis and the path coefficients, the results point to a strong connection between the effective implementation of supply chain management and the improvement of organizational performance, especially in terms of supply chain performance (Chowdhury, N.A. et al., 2020). This suggests that a well-executed supply chain management process can yield significant results. In other words, organizations with robust supply chain practices are more likely to achieve higher supply chain performance. Overall, the study concludes that aligning marketing strategies with organizational practices improves supply chain management and ultimately enhances supply chain performance.

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