



# A Study on Supply Chain Process and Relationship in Smartway Industrial Automation

Mr. R Bharathraj<sup>1</sup> And Dr. A. Jayanthi<sup>2</sup>

[<sup>1</sup>] MBA Student, Department of Management Studies, Hindusthan College of Engineering and Technology

[<sup>2</sup>] Associate Professor, Department of Management Studies, Hindusthan College of Engineering and Technology

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## Abstract

This research investigates the influence of key supply chain management (SCM) practices on the organizational performance of Smartway Industrial Automation, an emerging leader in the engineering design and services sector. The study specifically focuses on critical factors such as supplier relationship management, internal communication, information technology (IT) system adequacy, process automation, inventory management, cost reduction strategies, professional standards, and customer satisfaction. A descriptive research design was employed, utilizing a structured questionnaire to collect primary data from a sample of 150 employees engaged in supply chain-related roles within the company. The data were analyzed using statistical tools including percentage analysis, Pearson correlation, and Chi-square tests. The empirical findings reveal that effective collaboration with suppliers significantly contributes to operational cost reduction. Furthermore, the study establishes that employees' years of professional experience significantly shape their perception of optimal inventory management practices. In conclusion, the research demonstrates that robust supplier partnerships, efficient internal and external communication,

seamless technological integration, and professional conduct collectively enhance supply chain performance and overall organizational efficiency, while simultaneously identifying specific operational areas requiring continuous improvement.

**Keywords:** Supply Chain Management, Supplier Relationship Management, Inventory Management, Logistics Efficiency, Information Sharing, Industrial Automation, Organizational Performance.



## 1. Introduction

A supply chain management (SCM) system functions as a global network for the procurement, transformation, and delivery of products and services to end customers. It intricately links producers, suppliers, logistics providers, and consumers. All parties involved, directly or indirectly, in fulfilling a customer request are part of this chain, which includes not only manufacturers and suppliers but also carriers, warehouses, retailers, and the customers themselves. Within any business, SCM encompasses all functions involved in receiving and fulfilling client requests, including new product development, marketing, operations, distribution, finance, and customer support.

The core drivers of SCM performance are facilities, inventory, transportation, information, sourcing, and pricing. These drivers interact to determine the efficiency and responsiveness of the supply chain. Furthermore, three primary flows characterize SCM: the seamless flow of materials from manufacturer to user (material flow), the exchange of information including purchase orders, schedules, and performance reports (information/data flow), and the financial transactions from customers back to producers (money flow). Key contemporary SCM practices identified in this study include information sharing, postponement, lean and Just-in-Time (JIT) practices, Collaborative Planning Forecasting and Replenishment (CPFR), Vendor Managed Inventory (VMI), strategic supplier partnerships, reverse logistics, Green Supply Chain Management (GSCM), outsourcing, and cross-docking.

This study is contextualized within India's rapidly growing engineering and capital goods sector, a vital component of the national economy. Government initiatives like the 'Vision Plan 2030' and Production Linked Incentive (PLI) schemes are propelling growth in areas such as construction equipment, machine tools, automotive components, and medical devices. Smartway Industrial Automation, based in Coimbatore, operates within this dynamic environment, offering services including hardware and PCB design, product development, embedded technology, Android development, and in-plant training. The company's success is heavily reliant on a robust supply chain to innovate and deliver virtualized intellectual solutions to its industrial clientele.

## 2. Statement of the Problem

In the highly competitive industrial automation sector, effective supply chain processes and strong inter-organizational relationships are critical for ensuring timely delivery, cost efficiency, and customer satisfaction. Smartway Industrial Automation depends on a network of multiple suppliers, logistics providers, and distributors for the smooth flow of materials, components, and finished products. However, the company faces potential challenges that can adversely affect its supply chain performance. These issues include weak supplier coordination, inefficiencies in procurement and inventory management, delays in logistics and distribution, and inadequate information sharing among partners. Such problems can lead to increased operational costs, production delays, reduced responsiveness to customer requirements, and a subsequent loss of competitive advantage. Therefore, there is a pressing need to systematically investigate the existing supply chain processes and relationship practices at Smartway Industrial Automation to identify specific gaps, understand their impact on overall performance, and develop practical, evidence-based recommendations for improvement.

## 3. Need of the Study

The primary need for this study arises from the critical role of supply chain efficiency in the success of industrial automation firms. While existing literature largely focuses on conceptual optimization models or large-scale industry analyses, there is a distinct lack of firm-level empirical research that integrates the combined effects of supplier relationship management, procurement and inventory practices, logistics efficiency, and information sharing within a single organizational context, especially in the industrial automation sector. This study is necessary to bridge the gap between theoretical SCM principles and practical application at Smartway Industrial Automation. By providing statistically supported findings, the research will offer actionable insights for management to enhance decision-making, reduce operational costs,



improve project execution timelines, and increase customer satisfaction. Furthermore, it will contribute valuable empirical evidence to the academic literature on SCM in emerging economies.

#### 4. Objectives of the Study

The specific objectives guiding this research are as follows:

1. To study the effectiveness of supplier relationship management in Smartway Industrial Automation.
2. To analyze the procurement and inventory management practices adopted by the company.
3. To examine the efficiency of logistics and distribution in the supply chain process.
4. To assess the role of information sharing and coordination among supply chain partners.
5. To suggest suitable measures to improve overall supply chain performance based on the study variables.

#### 5. Scope of the Study

The scope of this research is explicitly limited to examining the supply chain processes and relationship practices of Smartway Industrial Automation. The investigation focuses on four key SCM dimensions: supplier relationship management, procurement and inventory management, logistics and distribution efficiency, and information sharing and coordination among supply chain partners. The study captures the perceptions and evaluations of 150 employees who are directly or indirectly involved in supply chain-related activities. The analysis is confined to the company's current operational practices and does not include a comparative analysis with other firms or industries. Consequently, the findings and recommendations are specific and directly relevant to Smartway Industrial Automation, offering a detailed case-based insight rather than broadly generalizable conclusions.

#### 6. Research Methodology

**Research Design:** A descriptive research design was adopted for this study. Descriptive research aims to accurately and systematically describe a population, situation, or phenomenon, answering questions related to what, where, when, and how.

**Data Collection:** Primary data were collected using a structured questionnaire comprising 25 questions. This included 5 demographic questions and 20 questions based on the four independent variables and the dependent variable. A 5-point Likert scale (ranging from 1 = Strongly Agree to 5 = Strongly Disagree) was used to measure respondents' perceptions.

**Sampling Framework:** The total population consisted of all employees of Smartway Industrial Automation. The target population was employees working in departments directly related to supply chain functions (e.g., supplier relations, procurement, inventory, logistics, and information coordination). Using a convenience sampling technique, a sample of 150 respondents was selected.

**Data Analysis:** The collected data were analyzed using simple percentage analysis, Pearson correlation, and Chi-square tests. Pie charts and bar diagrams were used for pictorial representation.

#### 7. Implications of the Study

The implications of this study are twofold: practical and academic. Practically, the findings provide the management of Smartway Industrial Automation with an evidence-based assessment of their current supply chain strengths and weaknesses. The study highlights that strong supplier relationships directly correlate with cost reduction, suggesting that investment in strategic partnerships yields tangible returns. The significant association between employee experience and inventory management perception implies the need for experience-tailored training programs. Recommendations include enhancing IT system adequacy,



implementing fully automated ordering systems, and improving real-time delivery capabilities, which can directly lead to greater operational efficiency, lower costs, and higher customer satisfaction. Academically, this research fills a gap in the literature by providing firm-level, empirically validated insights from the industrial automation sector, thereby serving as a valuable reference for future researchers and practitioners seeking to understand the integrated impact of relational and operational SCM variables.

## 8. Recommendations

Based on the findings and conclusions, the following recommendations are proposed for Smartway Industrial Automation:

- 1. Strengthen Supplier Partnerships:** Given the strong correlation between supplier involvement in specification planning and cost reduction, the company should formalize long-term strategic partnerships. Suppliers should be involved earlier in the product development and specification stages to leverage their expertise for cost-effective design and material selection.
- 2. Enhance IT and Automation Systems:** While most respondents find IT systems adequate, a significant minority do not. The company should invest in a more advanced, integrated Supply Chain Management (SCM) software platform. Furthermore, the automated ordering system for major suppliers should be fully implemented and expanded to ensure consistency and reduce manual errors.
- 3. Implement Experience-Targeted Inventory Training:** As employees' years of experience significantly influence their perception of optimal inventory levels, the company should develop tiered training programs. Newer employees may require foundational training on inventory principles, while experienced staff could benefit from advanced sessions on forecasting and just-in-time (JIT) inventory to align perceptions and practices.
- 4. Improve Real-Time Delivery and Communication:** To address the moderate perception of real-time delivery, the company should implement a more robust logistics tracking system and establish clear performance metrics (KPIs) for delivery lead times. Additionally, regular cross-departmental coordination meetings could further enhance the already efficient internal communication.
- 5. Foster a Culture of Continuous Improvement:** Despite strong positive feedback on professionalism and cost reduction, continuous improvement should be institutionalized. Regularly scheduled audits of procurement, logistics, and information-sharing processes, coupled with employee feedback mechanisms, will help identify and resolve emerging inefficiencies proactively.

## 9. Findings and Suggestions

### Key Findings:

- Demographic Profile:** The workforce is predominantly young (51% aged 25-35 years) and well-educated (41% undergraduates), with a balanced gender representation and a strong base of experienced employees.
- Supplier Relationship Management:** A majority of respondents feel suppliers are integrated into the organization (76% agree/strongly agree) and provide goods prior to payment (63.9%). However, perceptions on joint planning were mixed, with 28.6% remaining neutral.
- Procurement & Inventory:** Procurement is largely perceived as being based on quality, cost, and delivery reliability (71.5%). However, while many agree optimal inventory levels are maintained, 30% remained neutral, indicating uncertainty.



- **Logistics & Distribution:** Most respondents confirmed the existence of a vehicle maintenance policy (55.3%) and the reuse of recyclable materials (54.6%). Perceptions of real-time delivery were only moderate (51.3% agree/strongly agree).
- **Information Sharing:** Internal communication is viewed as efficient by a clear majority (62.6%). However, perceptions of IT system adequacy and data sharing with suppliers were moderately positive, indicating room for improvement.
- **Correlation Analysis:** A strong, positive, and statistically significant correlation ( $r = 0.662$ ,  $p < 0.01$ ) was found between supplier involvement in preparing specifications and overall cost reduction, confirming that effective SRM directly enhances supply chain performance.
- **Chi-Square Analysis:** A statistically significant association ( $\chi^2 = 26.974$ ,  $p = 0.042$ ) was established between years of experience and the perception of maintaining optimal inventory levels, proving that employee experience influences views on inventory management.

### Suggestions:

- Leverage the strong SRM-cost reduction link by formalizing collaborative planning with key suppliers.
- Address the neutral/mixed responses on inventory and joint planning by increasing transparency and communication.
- Invest in upgrading IT systems and fully automating ordering processes to address perceived inadequacies.
- Use the finding on experience-based perception to create targeted inventory management training.
- Focus on improving real-time delivery performance through better logistics tracking and KPIs.

## 10. Conclusion

This study concludes that supply chain management practices have a significant and meaningful impact on the organizational performance of Smartway Industrial Automation. The findings empirically validate that effective internal communication, strong supplier collaboration, strategic automation, and adequate IT systems are crucial drivers of efficiency and cost reduction. The positive perceptions held by a majority of respondents regarding professionalism, fulfillment of customer quality requirements, and supplier support indicate that the company has established a reasonably robust supply chain foundation. The statistical analysis reinforces this by confirming that supplier relationship management is a key contributor to cost reduction and that employee experience shapes critical perceptions of inventory management. While areas such as real-time delivery, full automation, and IT adequacy present opportunities for further development, the overall results clearly indicate that strengthening inter-organizational coordination, embracing technological integration, and deepening supplier partnerships will enhance Smartway Industrial Automation's operational effectiveness and long-term competitive advantage. Therefore, the study highlights that a commitment to continuous improvement in these supply chain practices is essential for achieving sustainable organizational growth.



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