

AN ANALYTICAL STUDY ON PROCESS OPTIMIZATION IN THE PROCUREMENT FUNCTION OF JAMNA AUTO INDUSTRIES, CHENNAI

Author

Dr. Velumoni D, SAKTHI GANAPATHY C

Department of Management Studies

Abstract

Inefficient workflows, manual processing, absence of technological integration, and lack of coordination across departments are persistent challenges in procurement functions in many organizations. These issues result in delays in the purchasing process, increased operational costs, ineffective supplier management, and lack of transparency. The present study aims to analytically examine process optimization in the procurement function of Jamna Auto Industries, Chennai. A descriptive research design was employed with a sample of 150 employees selected through convenience sampling. A structured questionnaire was used to collect primary data. Simple percentage analysis, chi-square analysis, and correlation were applied as statistical tools. The findings reveal a significant relationship between technology adoption and cost saving, and a positive correlation between employee skill development and cost saving. The study concludes that strategic investments in procurement technologies, continuous employee training, and alignment of sourcing decisions with organizational goals are critical to achieving procurement excellence and long-term competitiveness.

Keywords: *Procurement optimization, technology adoption, employee skill development, strategic sourcing, cost management, automotive industry.*

1. Introduction

Procurement is a systematic process that enables an organization to acquire the goods, services, or resources required for its operations. It encompasses determination of organizational requirements, appropriate supplier selection, negotiation of terms and conditions, and timely acquisition of materials. Procurement is a critical activity in any organization as it ensures the required inputs to production or service provision are available at the right time, in the right quantity, and at the right cost. Best procurement practices assist companies in ensuring operational continuity and the attainment of broader business goals.

Process optimization refers to the methodical enhancement of organizational processes aimed at realizing increased efficiency, optimal productivity, and efficient utilization of available resources. It involves the study of current workflows, identification of inefficiencies and bottlenecks, and the introduction of targeted improvement measures. In the context of procurement, process optimization encompasses automating procurement procedures, implementing digital procurement systems, enhancing supplier selection, improving inter-departmental coordination, and adopting strategic sourcing practices.

The automotive industry, one of the largest and most dynamic sectors globally, depends heavily on an efficient procurement function to sustain uninterrupted production. Jamna Auto Industries Ltd., established in 1954, is one of India's leading manufacturers of commercial vehicle suspension solutions. Its Chennai facility plays a crucial role in the company's supply chain and production capabilities. Given the complexity of procurement operations in the automotive sector, a study examining procurement optimization at Jamna Auto Industries is both timely and significant.

This study investigates process optimization in the procurement function of Jamna Auto Industries, Chennai, with a focus on four key dimensions: technology adoption, employee skill development, strategic

sourcing, and cost management. The findings contribute practical insights for improving procurement performance and organizational competitiveness.

2. Review of Literature

A growing body of literature highlights the importance of digitalization and process optimization in procurement. Naugolnova (2025) demonstrated that digital technologies enable greater accuracy in cost accounting and automate many processes, reducing the human factor in cost management and improving market competitiveness. Yadav and Singh (2025) argued that digitalization is the most viable alternative to neutralize procurement obstacles in supply chains, emphasizing that security, immutable data, traceability, and transparency are the key goals of a digital supply chain.

Lingegard and von Oelreich (2024) examined circular public procurement (CPP) and found that strategic decisions prioritizing sustainability are necessary when resource efficiency and cost reductions do not align in the short term. Bergqvist and Holm (2024) conducted a case study of a European battery manufacturer and found that the procurement function requires a comprehensive and adaptable expansion strategy to maintain quality during organizational scale-up.

Althabatah, Franzoi, and Menezes (2022) discussed Procurement 4.0 and identified that the key benefits of improved procurement include process optimization through digitization, skilled supplier selection, and on-time demand fulfillment. Bag et al. (2020) found that Procurement 4.0 performance review positively influences buyers' intention to optimize business processes and plays a key role in enhancing circular economy performance.

Yevu et al. (2022) used a neurofuzzy model to analyze strategies promoting electronic procurement systems (EPSs) in the construction industry, identifying 14 key strategies and highlighting dynamic influences. Govindan et al. (2023) argued that blockchain technology applications in procurement serve as a major enabler in securing supplier networks and improving supply chain efficiency.

Harju et al. (2023) found that procurement digitalization through data analytics and digital process maturity reduces uncertainty in the supply chain and improves supply chain resilience. Motatung and Sifolo (2023) explored digital procurement at an airport company and developed a framework for critical focus areas in digital procurement adoption. Salifu et al. (2023) found that ICT-related factors contribute most to e-procurement implementation challenges, recommending regular training and ICT infrastructure prioritization.

Straub et al. (2021) proposed a comprehensive skill taxonomy for circular business model implementation, identifying that general, sustainable, and circular skills are required for effective procurement in emerging business models. Cossa (2023) found that cost reduction strategies, including strategic partnerships and technology use, effectively reduce costs and optimize purchasing and procurement processes.

Research Gap

A review of prior research reveals that most studies focused on procurement processes, technologies, and their effectiveness in isolation. No comprehensive study has simultaneously addressed strategic sourcing, employee skill development, technology adoption, and cost management in an Indian automotive procurement context. This study addresses these gaps by providing an integrated analytical framework applied to Jamna Auto Industries, Chennai.

3. Research Methodology

A descriptive research design was adopted for this study, which is appropriate for systematically documenting and analyzing the characteristics of procurement processes within the organization. Descriptive research is valuable for generating hypotheses and informing theory development.

The study utilized both primary and secondary data. Primary data was collected through a structured questionnaire administered to employees involved in procurement-related activities at Jamna Auto Industries,

Chennai. Secondary data was obtained from textbooks, peer-reviewed journals, newspapers, and internet sources.

The sampling technique employed was convenience sampling, a non-probability method in which respondents are selected based on their availability and accessibility. This method was appropriate given resource constraints and the relative rarity of procurement-specific respondents within the organization. A sample size of 150 respondents was drawn from a population of 250 employees at the Chennai facility. The study was conducted over a period of three months.

The statistical tools applied for data analysis included: (1) Simple percentage analysis to describe the demographic and perceptual profile of respondents; (2) Chi-square analysis to test the hypothesis regarding the relationship between technology adoption and cost saving; and (3) Pearson correlation to examine the relationship between employee skill development and cost saving.

Hypotheses

H₀: There is no significant relationship between technology adoption and cost saving.

H₁: There is a positive relationship between employee skill development and cost saving.

4. Results and Discussion

4.1 Demographic Profile of Respondents

The majority of respondents (72.0%) were male, with 28.0% female, reflecting the male-dominated nature of procurement roles in the automotive manufacturing sector. The dominant age group was 30–35 years (60.7%), followed by below 30 years (22.0%), 36–40 years (9.3%), and above 40 years (8.0%), indicating a relatively young workforce.

In terms of educational qualification, 38.0% held an undergraduate degree, 25.3% had completed schooling, 24.0% held a diploma, 7.3% had professional qualifications, and 5.3% had postgraduate degrees. Regarding position, 32.7% were purchasing officers, 31.3% were executive management, 22.7% were procurement managers, 9.3% held other roles, and 4.0% were logistics coordinators.

The most common income bracket was Rs. 45,000 per month (47.3%), followed by Rs. 60,000 (22.7%), Rs. 80,000 (16.7%), Rs. 30,000 (7.3%), and less than Rs. 30,000 (6.0%). Half of the respondents (50.0%) had 2–4 years of experience in the organization.

Table 1: Demographic Profile of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	108	72.0
	Female	42	28.0
Age Group	Below 30 years	33	22.0
	30–35 years	91	60.7
	36–40 years	14	9.3
	Above 40 years	12	8.0
Education	Up to School	38	25.3
	Diploma	36	24.0
	UG	57	38.0

	PG	8	5.3
	Professional	11	7.3
Experience	0–2 years	17	11.3
	2–4 years	75	50.0
	4–6 years	27	18.0
	6–10 years	16	10.7
	More than 10 years	15	10.0

4.2 Technology Adoption in Procurement

Respondents were asked to rate their perceptions of technology adoption in procurement across five dimensions. The findings are summarized in Table 2.

Table 2: Technology Adoption Perceptions

Statement	Majority Response	%
E-procurement platforms improve transparency and efficiency	Strongly Agree	32.0
Automation tools reduce manual errors	Agree	41.3
Procurement software integrated with other systems	Disagree	27.3
Real-time analytics tools support decision-making	Strongly Agree	38.0
Digital procurement systems streamline activities	Agree	44.7

The data indicates broad support for e-procurement and real-time analytics adoption. However, a notable gap exists in integration of procurement software with other organizational systems (e.g., inventory and finance), where the majority disagreed. This highlights a systemic integration challenge that limits the full potential of technology adoption.

4.3 Employee Skill Development

Employee skill development was assessed across five dimensions covering training, competence, recognition, and feedback. Key findings are presented in Table 3.

Table 3: Employee Skill Development Perceptions

Statement	Majority Response	%
Training programs enhance procurement skills	Excellent	40.7
Employees adequately equipped for complex tasks	Excellent	44.7
Continuous learning opportunities available	Good	40.7
Organization recognizes employee contributions	Average	38.7
Feedback sought for skill development	Good	41.3

Training initiatives are rated highly by employees, and the majority feel well-equipped to handle complex procurement tasks. However, recognition of employee contributions to procurement was rated only average by the majority, suggesting that motivational mechanisms need strengthening. Continuous learning and feedback mechanisms received positive ratings, indicating a moderately healthy learning culture.

4.4 Strategic Sourcing

Strategic sourcing practices were evaluated across five dimensions. The results are presented in Table 4.

Table 4: Strategic Sourcing Perceptions

Statement	Majority Response	%
Organization employs strategic sourcing for long-term goals	Agree	34.7
Sourcing decisions aligned with business strategy	Neither Agree nor Disagree	35.3
Supplier capabilities considered in sourcing	Strongly Agree	42.7
Professionals seek innovation in sourcing	Strongly Disagree	32.0
Strategic sourcing contributes to success	Agree	29.3

The findings reveal that supplier capability assessment is well-regarded, with 42.7% of respondents strongly agreeing that the organization considers supplier capabilities in its strategic sourcing process. However, a significant proportion (32.0%) strongly disagreed that procurement professionals actively seek innovation in sourcing, pointing to a culture that may be reactive rather than proactive. The alignment of sourcing decisions with overall business strategy remains neutral for a majority, suggesting room for deeper strategic integration.

4.5 Cost Management in Procurement

Cost management was assessed across five areas. Key results are presented in Table 5.

Table 5: Cost Management Perceptions

Statement	Majority Response	%
Organization seeks cost-saving opportunities	Excellent	36.7
Cost analysis tools identify reduction areas	Good	32.7
Negotiation strategies achieve favorable pricing	Excellent	53.3
Total cost of ownership considered in decisions	Good	50.0
Procurement contributes to cost-effectiveness	Bad	40.0

The organization demonstrates strong performance in negotiation (53.3% excellent) and cost-saving orientation (36.7% excellent). The use of total cost of ownership (TCO) in decision-making is regarded as good by 50.0% of respondents. However, the overall contribution of procurement processes to organizational cost-

effectiveness was rated as bad by 40.0% of respondents, revealing a significant disconnect between individual cost-saving activities and systemic cost-effectiveness. This suggests that while tactical cost measures are in place, strategic alignment of procurement with financial performance requires improvement.

4.6 Hypothesis Testing

Chi-Square Analysis: Technology Adoption and Cost Saving

A chi-square test was conducted to examine the relationship between technology adoption and cost saving.

Table 6: Chi-Square Test Results

Test	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	374.832	255	0.000
Likelihood Ratio	274.016	255	0.197
Linear-by-Linear Association	34.785	1	0.000
N of Valid Cases	150		

The chi-square test yielded a Pearson Chi-Square value of 374.832 with a p-value of 0.000, which is less than the significance level of 0.05. Accordingly, the null hypothesis is rejected, confirming that there is a statistically significant relationship between technology adoption and cost saving. This finding aligns with the broader literature on digital procurement transformation and its financial implications.

Correlation Analysis: Employee Skill Development and Cost Saving

A Pearson correlation analysis was conducted to examine the association between employee skill development and cost saving.

Table 7: Pearson Correlation Results

Variables	Pearson Correlation (r)	Sig. (2-tailed)	N
Employee Skill Development & Cost Saving	0.474**	0.000	150

The Pearson correlation coefficient between employee skill development and cost saving is $r = 0.474$, which is statistically significant at the 0.01 level ($p = 0.000$). This indicates a moderate positive relationship between the two variables, affirming H₁. Organizations that invest in employee skill development in procurement are more likely to realize meaningful cost savings, consistent with Straub et al. (2021) and Cossa (2023).

5. Summary of Findings

The study produced the following key findings:

- The workforce is predominantly male (72.0%) and young, with 60.7% of respondents aged 30–35 years.
- The majority of respondents (38.0%) held undergraduate degrees, and 32.7% were employed as purchasing officers.

- Most respondents (40.0%) were only somewhat familiar with the organization's procurement policies and procedures, indicating a gap in policy communication.
- E-procurement platforms and real-time analytics tools received strong positive ratings (32.0% and 38.0% strongly agree, respectively), indicating technology adoption is underway.
- A key weakness was identified in system integration: 27.3% of respondents disagreed that procurement software is integrated with other organizational systems such as inventory and finance.
- Training programs and employee readiness for complex tasks were rated highly (40.7% and 44.7% excellent, respectively).
- Recognition of employee contributions to procurement was rated only average (38.7%), suggesting motivational gaps.
- Strategic sourcing is employed for long-term goals (34.7% agree), and supplier capabilities are well considered (42.7% strongly agree).
- Innovation in sourcing is lacking, with 32.0% strongly disagreeing that procurement professionals actively seek innovation opportunities.
- Negotiation strategies (53.3% excellent) and cost-saving orientation (36.7% excellent) are organizational strengths.
- Despite tactical cost-saving efforts, overall procurement contribution to cost-effectiveness was rated negatively (40.0% bad), indicating systemic inefficiency.
- Chi-square analysis confirmed a statistically significant relationship between technology adoption and cost saving ($p = 0.000$).
- Pearson correlation confirmed a moderate positive relationship between employee skill development and cost saving ($r = 0.474$, $p = 0.000$).

6. Recommendations

Based on the findings, the following recommendations are offered:

- The organization should prioritize investment in advanced procurement technologies to maintain competitiveness and improve process efficiency.
- Continuous training sessions should be provided to ensure staff are adequately equipped to utilize new procurement technologies.
- Procurement software should be integrated with other organizational systems (inventory, finance) to eliminate data silos and enable real-time decision-making.
- A structured employee recognition and reward system focused on procurement contributions should be developed to improve motivation and performance.
- Opportunities for continuous learning should be made more accessible to support ongoing development of procurement competencies.
- Procurement professionals should be encouraged to actively pursue innovation in sourcing through structured innovation programs and knowledge-sharing platforms.
- Sourcing decisions should be more explicitly aligned with the overall business strategy to ensure coherence between procurement and organizational objectives.
- Total cost of ownership (TCO) should be systematically factored into all procurement decisions to ensure sustainable financial performance.
- Procurement processes should be continuously assessed against key performance indicators (KPIs) such as cycle time, supplier performance, and cost efficiency.
- A culture of continuous improvement in procurement should be promoted, involving cross-functional collaboration between procurement, finance, operations, and supply chain teams.

7. Conclusion

This study provides a comprehensive analytical examination of procurement process optimization at Jamna Auto Industries, Chennai. The findings affirm that technology adoption, employee skill development, strategic sourcing, and cost management are interrelated drivers of procurement performance. Statistically significant relationships between technology adoption and cost saving, and a positive correlation between employee skill development and cost saving, underscore the importance of investing in both digital infrastructure and human capital.

While the organization demonstrates strengths in negotiation, training initiatives, and e-procurement adoption, significant gaps exist in system integration, sourcing innovation, and strategic alignment of cost management. Addressing these gaps through targeted interventions will be essential for Jamna Auto Industries to navigate the evolving procurement landscape, enhance competitiveness, and achieve long-term organizational success.

The study contributes to the growing body of literature on Procurement 4.0 and provides empirically grounded practical recommendations applicable to the Indian automotive manufacturing sector. Future research could extend this framework to multiple plants or other organizations in the sector to validate and generalize the findings.

8. Limitations

This study is limited to the procurement operations of Jamna Auto Industries Ltd. in Chennai and may not represent procurement practices at other locations or plants of the organization. The sample of 150 respondents, while adequate for the analysis, may not fully represent the entire organization or the broader automotive industry. The study is cross-sectional in nature and data collected via questionnaire may be subject to respondent perception bias. Future longitudinal studies incorporating objective procurement performance data would strengthen the findings.

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