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Effectiveness Of Purchase Order Processing System In Automobile Component Manufacturing: A Study At Sundram Fasteners Limited

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ABSTRACT

Efficient procurement management is a critical determinant of operational performance in manufacturing organizations. This study examines the effectiveness of the Purchase Order Processing System (POPS) implemented at Sundram Fasteners Limited, a flagship enterprise of the TVS Group and a leading manufacturer of automotive components headquartered in Chennai, India. Primary data were collected from 51 respondents across departments including purchasing, finance, inventory, warehouse, and administration using a structured questionnaire with Likert-scale response options. Statistical analysis was performed using SPSS software, employing percentage analysis, correlation analysis, ANOVA, and regression analysis. Findings reveal that 72% of respondents agree or strongly agree that purchase orders reduce procurement errors, while 76% affirm their positive impact on supplier communication. Regression analysis confirms that proper budgeting and supplier communication are the strongest predictors of purchase order system effectiveness, collectively explaining 71.6% of the variance in procurement performance ($R^2 = 0.716$, $p < 0.001$). ANOVA results indicate no significant difference in perceptions across age groups ($p = 0.132$), suggesting uniform acceptance of the system across employee demographics. The study concludes that a well-structured purchase order system materially improves procurement accuracy, transparency, inventory control, and interdepartmental coordination. Practical recommendations include ERP integration, digital approval workflows, supplier communication platforms, and periodic employee training programmes.

Keywords*: Purchase Order Processing, Procurement Management, Automotive Components, Supplier Communication, ERP Integration, Sundram Fasteners Limited*

INTRODUCTION

Procurement management is central to the operational efficiency of any manufacturing enterprise. A Purchase Order Processing System (POPS) serves as the formal mechanism through which organizations initiate, authorize, track, and complete purchasing activities. In high-volume manufacturing environments, where thousands of

components must be sourced reliably and on schedule, the discipline and accuracy of the purchase order workflow directly determines whether production targets are met, inventory is controlled, and supplier relationships remain productive.

The Indian automobile component industry operates within this high-stakes procurement environment. As one of the fastest-growing manufacturing sectors in the country, the industry generated exports worth USD 21.2 billion in 2022-23 and employs over 1.5 million people directly. Within this landscape, Sundram Fasteners Limited occupies a prominent position — established in 1962 as part of the TVS Group, the company manufactures high-tensile fasteners, cold extruded components, hot forged parts, powder metallurgy products, and precision-engineered automotive parts for customers across India, the United States, Germany, Japan, and other international markets.

Despite the strategic importance of procurement in such an organization, research on the specific effectiveness of purchase order processing systems within Indian auto component manufacturers remains limited. Most existing studies address e-procurement models in general terms, while the practical performance of organization-specific systems — encompassing approval workflows, supplier coordination, inventory integration, and employee usability — has received comparatively little attention. This study addresses that gap through a primary data investigation at Sundram Fasteners Limited, combining quantitative employee survey data with statistical modelling to assess how well the existing system performs across its core procurement functions.

The primary objective of the study is to evaluate the effectiveness of the Purchase Order Processing System in improving procurement activities, order management, supplier coordination, and operational efficiency within the organization. Secondary objectives include analysing the existing purchase order workflow, identifying approval and processing delays, examining cross-departmental coordination, and evaluating the role of automation in improving procurement speed and accuracy.

LITERATURE REVIEW

Manas Ranjan Pani et al. (2011) demonstrate that electronic procurement systems reduce manual processing time and human error rates while improving transparency across the supply chain. They identify implementation barriers including employee resistance, insufficient training, and system integration challenges — findings that inform the present study's attention to employee usability and training adequacy.

Schoenherr and Tummala (2007) establish that purchase order processing systems reduce procurement delays and increase transaction accuracy, with particular benefits observed in supplier communication and invoice processing. Their recommendation for real-time monitoring capabilities directly underpins the tracking and approval workflow dimensions assessed in this study.

Croom and Brandon-Jones (2005) examine e-procurement in public sector organizations, finding that automated purchase order systems reduce procurement cycle time and improve accountability. Their identification of technical infrastructure gaps and management support deficits as implementation barriers is relevant to manufacturing contexts with legacy systems.

Glock and Hochrein (2014) review purchasing organization structures across industries, concluding that computerized procurement systems improve coordination between purchasing departments, suppliers, and inventory teams — a relationship this study tests empirically through correlation analysis of these variables.

Singh and Vij (2022) examine the role of cloud computing and data analytics in procurement, finding that digital purchase order systems reduce operational costs and improve workflow efficiency. Norgah et al. (2024) extend this analysis to evaluate critical attributes of e-procurement platforms, identifying automation, security, and user-friendliness as decisive for system success. Together, these studies frame the technological enhancement recommendations developed in Section 5.

RESEARCH METHODOLOGY

Research Design

The study employs a descriptive research design with a survey-based primary data collection approach. The research was conducted within Sundram Fasteners Limited, focusing on employees directly or indirectly involved in purchase order processing activities across the purchasing, inventory management, finance, warehouse, and procurement departments.

Sample and Sampling Technique

A sample of 51 respondents was selected using convenience sampling, which is appropriate for organizational studies where the researcher has direct access to employees with relevant operational experience. Respondents include personnel engaged in purchase requisition, order approval, supplier coordination, inventory verification, and purchase order tracking — roles that span the full procurement workflow.

Data Collection

Primary data were collected through a structured questionnaire containing close-ended Likert-scale items (Strongly Agree to Strongly Disagree). The questionnaire covered purchase order effectiveness across dimensions including record maintenance, supplier communication, error reduction, transparency, approval efficiency, inventory management, and overall procurement performance. Secondary data were obtained from company records, procurement reports, academic journals, and online research papers.

Statistical Tools

Data were analysed using SPSS software. The analytical toolkit comprises: (i) Percentage Analysis for demographic and response distribution; (ii) Correlation Analysis to measure relationships among procurement variables; (iii) One-Way ANOVA to test differences in perceptions across age groups; and (iv) Regression Analysis to identify predictors of overall purchase order system effectiveness.

DATA ANALYSIS AND FINDINGS

Respondent Profile

Variable	Category	Frequency	Percentage (%)
Age Group	Below 20	10	20%

	21–30 years	35	69%
	31–40 years	4	8%
	41–50 years	2	4%
Gender	Male	34	67%
	Female	17	33%
Education	Undergraduate	7	14%
	Graduate	11	22%
	Postgraduate	31	61%
Occupation	Student	19	37%
	Employee	24	47%
	Business	8	16%
Work Experience	< 1 year	20	39%
	1–3 years	20	39%
	3–5 years	10	20%
	> 5 years	1	2%

Table 1: Demographic Profile of Respondents (n = 51)

The majority of respondents (69%) belong to the 21–30 age group, reflecting the active involvement of early-career employees in procurement operations. Male respondents constitute 67% of the sample. Postgraduate qualifications are held by 61% of respondents, indicating a well-educated workforce. Employees form the largest occupational group (47%), while 78% of respondents have fewer than three years of work experience—underscoring the importance of system usability and employee training in organizational effectiveness.

Purchase Order Effectiveness — Key Response Distributions

Statement	SA (%)	A (%)	N (%)	D (%)	SD (%)
Helps maintain proper purchasing records	16	49	20	14	2
Reduces confusion in buying products	25	43	16	6	10
Improves communication with suppliers	31	47	12	6	4
Helps track purchased items easily	25	33	18	12	12
Reduces errors in procurement activities	39	33	16	4	8

Helps control organizational expenses	27	45	16	8	4
Improves transparency in procurement	35	41	14	6	4
Increases efficiency in purchasing	29	47	12	8	4
Helps avoid duplicate purchases	33	39	16	8	4
Improves accountability in organizations	35	43	12	6	4
Simplifies the approval process	29	49	10	8	4
Helps maintain supplier relationships	33	41	16	6	4
Essential for organizational procurement	41	37	12	6	4

Table 2: Response Distribution for Purchase Order Effectiveness Statements (SA=Strongly Agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly Disagree)

Across all effectiveness dimensions, respondent agreement levels are consistently high. Supplier communication records the strongest combined endorsement (78% agree or strongly agree), followed by transparency improvement (76%) and efficiency enhancement (76%). The statement that purchase orders are essential for organizational procurement attracts the highest frequency of strong agreement (41%), suggesting widespread recognition of their strategic importance. Items related to tracking and duplicate purchase prevention show moderate disagreement levels (24% and 12% respectively), pointing to opportunities for system enhancement in these areas.

Overall Satisfaction

Satisfaction Level	Frequency	Percentage (%)
Highly Satisfied	16	31%
Satisfied	23	45%
Neutral	7	14%
Dissatisfied	3	6%
Highly Dissatisfied	2	4%
Total	51	100%

Table 3: Overall Satisfaction with the Purchase Order System

Seventy-six percent of respondents express satisfaction or high satisfaction with the purchase order system, while only 10% report dissatisfaction. The 14% neutral category represents employees who may benefit from enhanced training or system usability improvements. This distribution confirms that the prevailing employee experience of

the system is positive, though scope exists for converting neutral respondents into satisfied users through targeted organizational interventions.

One-Way ANOVA: Age Group and Purchase Order Effectiveness

Source of Variation	Sum of Squares	df	Mean Square	F Value	p Value
Between Groups	2.357	3	0.786	1.965	0.132
Within Groups	18.793	47	0.400	—	—
Total	21.150	50	—	—	—

Table 4: One-Way ANOVA — Age Group and Overall Purchase Order Effectiveness

The ANOVA result (F = 1.965, p = 0.132) indicates no statistically significant difference in purchase order effectiveness perceptions across age groups. This finding is organizationally significant: it suggests that the system is perceived similarly by both younger and more experienced employees, pointing to a broadly shared understanding of procurement workflow and consistent system acceptance across demographic cohorts.

1.1 Correlation Analysis

Variable	Purchasing Records	Supplier Communication	Proper Budgeting	Purchasing Efficiency
Purchasing Records	1.000	0.286	0.460	0.357
Supplier Communication	0.286	1.000	0.365	0.206
Proper Budgeting	0.460	0.365	1.000	0.593
Purchasing Efficiency	0.357	0.206	0.593	1.000

Table 5: Correlation Matrix — Key Purchase Order Variables

All inter-variable correlations are positive, confirming that procurement effectiveness dimensions move in the same direction across the organization. The strongest association (r = 0.593) is between proper budgeting and purchasing efficiency, indicating that financial discipline within procurement directly enables operational performance gains. The moderate correlations between purchasing records and budgeting (r = 0.460) and between purchasing records and efficiency (r = 0.357) further affirm that documentation accuracy is a foundational enabler of broader system performance.

Regression Analysis: Predictors of Purchase Order Effectiveness

Variable	Beta Coefficient	t Value	p Value
Constant	0.736	2.446	0.018
Proper Purchasing Records	0.128	2.177	0.035

Supplier Communication	0.254	4.718	0.000
Proper Budgeting	0.421	5.436	0.000

Table 6: Regression Analysis — Factors Influencing Purchase Order System Effectiveness (R = 0.846, R^2 = 0.716, Adjusted R^2 = 0.698, F = 39.480, p < 0.001)

The regression model explains 71.6% of the variance in purchase order system effectiveness ($R^2 = 0.716$), with all three predictors achieving statistical significance. Proper budgeting emerges as the strongest predictor ($\beta = 0.421$, $p < 0.001$), followed by supplier communication ($\beta = 0.254$, $p < 0.001$) and proper purchasing records ($\beta = 0.128$, $p = 0.035$). This hierarchy of influence informs the priority ordering of the recommendations presented in Section 5: budgetary discipline and supplier communication infrastructure should be the primary investment targets for organizations seeking to improve purchase order system performance.

RECOMMENDATIONS

ERP Integration and Digital Approval Workflows

The regression model's identification of proper budgeting as the dominant effectiveness predictor points directly to the need for integrated financial controls within the purchase order system. Organizations should implement ERP-linked procurement modules that enforce budget validation at the point of purchase order creation, preventing orders that exceed allocated limits from proceeding without escalated approval. Digital approval workflows — replacing paper-based or email-based authorization chains — compress approval cycle times and create auditable electronic records of every procurement decision. Cloud-based procurement platforms further extend these benefits by enabling real-time budget monitoring and cross-departmental visibility.

Supplier Communication Infrastructure

With supplier communication identified as the second strongest predictor of system effectiveness ($\beta = 0.254$), strengthening digital supplier interaction channels is a high-return priority. Dedicated supplier portals through which purchase orders are issued, acknowledged, and tracked in real time reduce communication delays and eliminate the ambiguity that arises from informal channels. Automated delivery schedule reminders and exception alerts — triggered when orders approach delivery dates without confirmation — reduce the coordination overhead currently borne by purchasing staff and improve on-time delivery rates.

Employee Training and System Usability

The concentration of respondents in early-career stages (78% with fewer than three years of experience) and the 14% neutral satisfaction segment together signal a training and onboarding gap. Structured induction programmes for new procurement staff — covering purchase requisition workflows, system navigation, supplier communication protocols, and approval escalation procedures — would improve both system utilization rates and user confidence. Periodic refresher training incorporating process updates should be institutionalized, with completion tracked through the HR management system.

Inventory Coordination and Duplicate Purchase Prevention

The comparatively higher disagreement rates observed for tracking and duplicate purchase prevention (Table 2) suggest that inventory coordination is the weakest functional area of the current system. Real-time inventory

linkage — where purchase order creation is automatically validated against current stock levels — would prevent duplicate procurement and reduce unnecessary expenditure. Periodic procurement audits comparing purchase orders against inventory consumption records provide an additional control layer.

CONCLUSION

This study provides empirical evidence that the Purchase Order Processing System at Sundram Fasteners Limited performs effectively across its core procurement functions, with 76% of respondents expressing overall satisfaction and consistently high agreement rates across effectiveness dimensions including supplier communication, transparency, accountability, and approval simplification. The regression model confirms that proper budgeting ($\beta = 0.421$) and supplier communication ($\beta = 0.254$) are the primary drivers of system performance, together with purchasing record accuracy ($\beta = 0.128$), collectively explaining 71.6% of variance in procurement effectiveness.

ANOVA analysis establishes that effectiveness perceptions are uniform across employee age groups ($p = 0.132$), indicating broad and demographically consistent system acceptance. Correlation analysis confirms positive and mutually reinforcing relationships among all key procurement variables, with the budgeting-efficiency linkage ($r = 0.593$) representing the strongest observed association.

The practical implications are clear: organizations seeking to improve purchase order system performance should prioritize ERP integration for budget enforcement, invest in supplier communication platforms, and implement structured employee training programmes — particularly for early-career staff. Inventory coordination mechanisms targeting duplicate purchase prevention represent the highest-priority functional gap identified in the data.

Future research could extend this investigation to multiple automotive component manufacturers to enable cross-firm comparison, examine the specific impact of ERP adoption on purchase order cycle times, and apply the analytical framework to import procurement operations. Longitudinal studies tracking satisfaction and effectiveness metrics before and after system upgrades would provide particularly actionable insights for procurement managers in the Indian automobile components sector.

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