



## **Topic**

Costs Optimization In Supply Chain Management Of Construction Material at Gia Thy  
Company, Vietnam

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August 27th, 2025

# Strategic Supply Chain Design as a Core Driver for Cost Optimization: Evidence from Gia Thy Company, Vietnam

## Abstract

This research investigates the critical factors influencing cost optimization (CO) within the construction material supply chain. Using a Multiple Linear Regression model, five variables—System Approach (SA), Operating Costs and Routes (OCR), Holding and Transportation Costs (HTC), System Design (SD), and System Reliability (SR)—were tested. Findings from 54 experts at Gia Thy Company reveal that System Design is the sole statistically significant predictor of CO (beta = 0.48,  $p = 0.002$ ), while traditional operational factors remain insignificant.

## 1. Introduction

The construction industry faces high financial risks and price volatility. For major contractors, managing supply chain efficiency is vital for securing profit margins. While conventional strategies focus on incremental operational improvements, a research gap exists regarding the impact of the foundational network structure—**System Design**—on sustainable cost performance.

## 2. Methodology

This study employed a quantitative research design:

- **Sample:** 54 managers and engineers at Gia Thy Company.
- **Instrument:** A 5-point Likert scale questionnaire.
- **Analysis:** Reliability testing (Cronbach's Alpha > 0.85) and Multiple Linear Regression via SPSS/PSPP.

## 3. Results and Key Findings

The regression model demonstrated strong explanatory power ( $R^2 = 0.71$ ), explaining 71% of the variance in Cost Optimization.

- **Dominance of System Design:** SD emerged as the most influential factor. A one-standard-deviation increase in SD leads to a 0.48 increase in CO.
- **Insignificance of Operational Factors:** Counterintuitively, SA ( $p=0.077$ ), OCR ( $p=0.810$ ), HTC ( $p=0.461$ ), and SR ( $p=0.305$ ) did not show significant direct impacts.
- **Framework Equation:**  $CO = 0.48 \times (\text{System Design})$ .

## 4. Strategic Recommendations

To achieve effective CO, organizations must prioritize structural planning over isolated cost-cutting:

1. **Network Topology:** Scientifically design internal site road networks to minimize distance and travel time.
2. **Equipment Location:** Place warehouses and key equipment (cranes, mixers) near points of use to reduce internal transport costs.
3. **Technical Integration:** Incorporate industry standards and compliance directly into the initial design phase to avoid rework costs.

## 5. Conclusion

The research confirms that strategic **System Design**—including site layout, equipment sizing, and network topology—is the primary leverage point for cost optimization in construction. Future studies should utilize larger samples to test the generalizability of this structural-focus model.