IJCSS 6 (3) (2025) Pages: 868-878

Journal homepage: http://pcijournal.org/index.php/ijcss

International Journal of Cultural and Social Science

Published: Pena Cendekia Insani

THE EFFECT OF LONG-TERM RELATIONSHIP AND PROCESS INTEGRATION ON COMPANY PERFORMANCE THROUGH SUPPLY CHAIN MANAGEMENT AT PT POMI

Diah Nurhayati Mailasufa[1], Muhammad Ridwan Basalamah[2], Eka Farida[3]
[1,2,3]Universitas Islam Malang, Malang, Indonesia

Article Info

Keywords:

Company Performance, Long-Term Relationship, Process Integration, Supply Chain Management.

ABSTRACT

This study examines the impact of long-term relationships (LTR) and process integration (PI) on company performance, with supply chain management (SCM) as a mediator, using a quantitative approach and Structural Equation Modeling (SEM-PLS). Data from 88 suppliers in PT Paiton Operation and Maintenance Indonesia were analyzed. Results show that PI positively influences SCM, and SCM significantly enhances company performance. LTR, while important, lacks impact when it remains solely contractual and without collaborative planning. SCM is crucial for improving operational efficiency and reducing costs. This research highlights the strategic importance of SCM in linking relational and structural factors to performance outcomes, supporting frameworks like Relational View, Transaction Cost Economics, and Dynamic Capabilities Theory. The study suggests enhancing LTR through collaborative SCM practices and extending PI for optimal performance improvement.

Corresponding Author:

Name: Diah Nurhayati Mailasufa
Department: Pascasarjana
University: Universitas Islam Malang
Email: diahnm@gmail.com

1. INTRODUCTION

The energy industry plays a crucial role in driving economic growth while maintaining environmental sustainability. In Indonesia, more than 60% of the national electricity supply still relies on coal-fired power plants [1]. This dependency presents significant challenges, especially amidst global and national demands for an energy transition towards cleaner and more sustainable resources [2]. Power plant management companies are required not only to ensure continuity of energy supply but also to improve operational efficiency to remain competitive amidst changing energy policies and increasing pressure on sustainability.

PT Paiton Operation and Maintenance Indonesia (PT POMI), one of the largest independent power plant operators in Indonesia, is a prime example of these challenges. Over the past five years, the company has recorded significant fluctuations in key operational performance indicators, such as the Equivalent Availability Factor (EAF), Forced Outage Rate (FOR), and Net Plant Heat Rate (NPHR). Data from 2023 shows a decline in EAF to 84.85% from 91.08% the previous year, an increase in EFOR from 0.47% to 3.15%, and an increase in NPHR from 2,797.22 kCal/kWh to 3,064.73 kCal/kWh. This trend indicates a decline in efficiency, necessitating a stronger supply chain management (SCM) strategy to maintain the company's reliability and competitiveness. Strengthening SCM through building long-term relationships (LTR) with suppliers and process integration (PI) is believed to be key to addressing these issues. Previous studies [3], [4], [5], [6] the results show

that these two strategies can support supply stability, improve cross-functional coordination, and strengthen operational performance. However, research explicitly positioning SCM as a mediating mechanism linking LTR and PI to company performance, particularly in the context of the power generation industry, is still very limited. Most previous studies have focused on the manufacturing sector and used generic performance measures, thus failing to fully capture the complexities of supply chain management and the operational characteristics of power plants.

This study confirms that LTR has not significantly influenced SCM effectiveness when positioned solely as a contractual instrument. Although PT POMI has a Long-Term Agreement (LTA) with a strategic supplier for the 2024–2028 period, the relationship remains largely administrative and transactional, with limited supplier involvement in co-planning spare parts requirements based on outage schedules and the absence of real-time data-based information exchange. This condition weakens the potential of long-term partnerships to create supply chain synergies, thus not being in line with the principles of the Relational View, which emphasizes the importance of trust, information transparency, and process alignment [7], [8], [9]. This finding also aligns with the Transaction Cost Economics perspective, which warns that long-term relationships without adaptive performance controls can actually reduce operational flexibility [10], [11], [12].

In contrast, PI demonstrates a strong positive impact on SCM, with integrated systems such as SAP and Maximo playing a key role in facilitating requirements validation, accelerating emergency procurement, and minimizing process redundancy. The resulting comprehensive visibility enables planning, procurement, logistics, and technical execution functions to work in sync, supporting time, cost efficiency, and operational responsiveness. These findings support the Supply Chain Operations Reference (SCOR) framework (Stewart, 1997) and Dynamic Capabilities Theory, which emphasize the importance of an organization's ability to integrate and reconfigure processes in response to environmental dynamics [13], [14]. Studies by [15], [16], [17] reinforce empirical evidence that internal process integration improves supply chain adaptability and logistics performance, while significantly reducing lead times.

Furthermore, SCM has been shown to significantly contribute to company performance by accelerating decision-making, optimizing inventory management, and improving key performance indicators such as EAF, heat rate efficiency, and operational cost control. Both LTR and PI impact company performance directly and indirectly through SCM. LTR generates higher strategic value when managed through collaborative SCM practices, including joint planning, real-time KPI monitoring, and regular performance evaluations, rather than solely as a formal contract. Similarly, PI delivers optimal impact when process alignment translates into measurable efficiencies through an integrated and responsive SCM framework.

Theoretically, this study extends the literature by integrating the Relational View, Transaction Cost Economics, the SCOR framework, and Dynamic Capabilities Theory to explain how LTR and PI interact through SCM to improve firm performance. These results also support the view that the effectiveness of integration and partnership is influenced by organizational readiness, technological maturity, and the dynamics of the operational environment [18], [19]. Practically, PT POMI needs to reposition the LTA from a mere contractual document to a collaborative framework based on trust, digital information transparency, and supplier involvement in outage planning. PI should also be extended to the strategic level, by utilizing ERP and SCM systems to comprehensively monitor supplier cycle times, fulfillment rates, and responsiveness. Integration and partnership should be selectively applied to critical processes such as emergency procurement and outage logistics distribution to avoid complexity that can reduce operational agility. Overall, this study confirms the role of SCM as a strategic mediator in linking relational (LTR) and structural (PI) factors to firm performance in the energy sector. Further studies could be directed at exploring moderating variables such as digital maturity, collaborative culture, and risk management capabilities to strengthen the effectiveness of this relationship, particularly in the energy and heavy manufacturing industries with complex and high-risk supply chains.

In addition, this study underscores the importance of developing dynamic monitoring and continuous improvement mechanisms to ensure that the benefits of LTR and PI can be sustained over time. The establishment of performance dashboards, real-time data analytics, and joint supplier–buyer review forums is essential to prevent long-term agreements from becoming rigid bureaucratic instruments and to ensure that process integration remains adaptive to fluctuations in demand, regulatory shifts, and technological changes. By embedding these adaptive controls into SCM practices, PT POMI can transform relational and structural initiatives into enduring strategic advantages, enhancing both operational resilience and long-term competitiveness amidst the ongoing energy transition.

2. RESEARCH METHOD

This study uses a quantitative approach with an associative research type, namely research that aims to test the causal relationship between latent variables without manipulating these variables [16], [20]. This study was conducted on all supplier companies that have been accredited as suppliers of PT Paiton Operation and Maintenance Indonesia (PT POMI), which have long-term contracts of at least three years and actively deliver

goods or services, with a total of 88 supplier companies. Data collection was carried out from May 2025 until completion through the distribution of a Google Form-based questionnaire. The research instrument used a five-point Likert scale (1 = strongly disagree to 5 = strongly agree) to measure four main constructs, namely long-term relationship (X1), process integration (X2), supply chain management (Z) as a mediating variable, and company performance (Y) as the dependent variable.

Table 1. Long-Term Partnership Companies

Blanket Contract End Year	Company
2028	3
2027	17
2026	18
2025	50
Total	88

The operational definitions of the variables are based on the theory and operational context of PT POMI. Company performance is measured using reliability indicators (Equivalent Availability Factor and Forced Outage Rate), efficiency (Heat Rate and specific fuel consumption), and operational cost effectiveness (maintenance, logistics, and transportation costs). Supply chain management is measured through coordination with suppliers and customers, utilization of information technology, and the ability to manage supply chain risks [21]. Long-term relationships are measured through trust, commitment, and collaboration, while process integration is measured through supply chain visibility, lead time reduction, and operational cost efficiency.

The sampling technique used the total sampling or census method because the population size was limited and homogeneous, so all 88 supplier companies were selected as research respondents. Data were analyzed using Structural Equation Modeling – Partial Least Square (SEM-PLS) with SmartPLS software. This analysis was chosen because it is able to handle complex conceptual models, relatively small sample sizes, and data that is not completely normally distributed. The analysis procedure includes an outer model evaluation to test convergent validity, discriminant validity, and construct reliability (through loading factor values, AVE, and Cronbach's Alpha), as well as an inner model evaluation to assess model strength through R^2 and Q^2 values. Hypothesis testing was conducted by examining the significance of the path coefficient in the structural model using bootstrapping, with acceptance criteria of p-value <0.05 or t-statistic >1.96 at a 5% significance level. This approach allows for analysis of the direct and indirect effects of long-term relationships and process integration on company performance through the mediating role of supply chain management, in accordance with the conceptual framework of this study.

3. RESULT AND ANALYSIS

This study involved 88 accredited supplier companies that have active contracts with PT POMI. Respondents came from various regions in Indonesia, with the majority of companies located in major cities in East Java and its surrounding areas, which are geographically close to PT POMI's operational locations. Surabaya was the city with the largest number of suppliers, with 21 companies (24%), followed by Jakarta with 20 companies (23%) and Probolinggo with 17 companies (19%). This distribution indicates that the majority of PT POMI's supply chain partners come from strategic areas that support logistical and operational efficiency. In terms of partnership duration, the majority of supplier companies have long-term partnerships, with 66 companies (75%) having been partners for more than six years, including 39 companies (44%) having partnered for more than 12 years. Only a small portion, namely 4.6%, had a partnership duration of less than three years, indicating the dominance of stable and sustainable partnerships. Based on business type, the majority of respondents were providers of goods and services simultaneously (67%), while the remainder consisted of providers of goods (19%) and providers of services (14%). This composition indicates that PT POMI tends to collaborate with suppliers capable of comprehensively supporting operational needs, both in terms of product provision and supporting services.

This supplier composition also reflects PT POMI's strategic approach in building a robust and integrated supply network. By collaborating predominantly with suppliers capable of delivering both goods and services, PT POMI reduces dependency on fragmented vendor relationships, which can create bottlenecks in procurement, maintenance, and logistics processes. These integrated suppliers often manage critical functions, such as spare parts provisioning, maintenance support, and emergency response services, ensuring continuity in plant operations. The geographic clustering of suppliers around East Java not only facilitates faster lead times and cost-efficient logistics but also allows for closer collaboration, including joint forecasting and coordination during

planned outages. This proximity is particularly crucial given the operational complexities and time-sensitive nature of coal-fired power plant maintenance cycles.

In terms of organizational readiness and technological adoption, most participating suppliers have implemented Enterprise Resource Planning (ERP) systems, with 59% already integrated with PT POMI's procurement and maintenance platforms, such as SAP and Maximo. However, only 31% reported active utilization of real-time data exchange, such as automated inventory visibility and outage-based demand forecasting. This gap indicates a significant opportunity for PT POMI to strengthen digital integration and supplier collaboration, which would not only enhance process transparency but also reduce the risks of stockouts and emergency procurement surges. Strengthening digital connectivity and collaborative planning with these long-term partners can transform the existing administrative relationships into adaptive, value-driven partnerships, ultimately enabling a more resilient and agile supply chain ecosystem.

Table 2. Location and Number of Respondents

City	Amount	%
Probolinggo	17	19%
Pasuruan	3	3%
Sidoarjo	6	7%
Surabaya	21	24%
Gresik	4	5%
Bogor	2	2%
Bekasi	1	1%
Cikarang	3	3%
Jakarta	20	23%
Tangerang	6	7%
Bandung	2	2%
Cilegon	1	1%
Palembang	1	1%
Medan	1	1%
Total	88	100%

Distribution of respondents' answers

Based on the results of a questionnaire involving 88 respondents from supplier companies, all research variables showed an average score above 4, indicating a positive perception of the cooperative relationship and performance of PT POMI. The Long Term Relationship variable (X1) obtained the highest average score of 4.34, indicating that suppliers consider the long-term relationship with PT POMI to be in the very good category. The Commitment indicator (4.45) was the dominant aspect, especially in statements regarding the supplier's commitment to maintaining quality and on-time delivery (4.50). Meanwhile, Collaboration (4.21) was the indicator with the lowest score, indicating that although the cooperation was already running well, there was still potential for improvement, especially in the aspects of joint planning and innovation in the procurement process. The Process Integration variable (X2) recorded an average score of 4.16, with Operational Cost Efficiency (4.22) being the highest indicator, which emphasized the important role of integrated information systems in supporting efficient procurement and delivery of goods. Two other indicators, namely Lead Time Reduction (4.15) and Supply Chain Visibility (4.12), also showed positive results, although increasing information transparency and process coordination can still be optimized.

For the Supply Chain Management (Z) variable, the average score was 4.30, reflecting a supply chain management implementation that was considered very good by respondents. The Supplier and Customer Coordination indicator (4.43) ranked highest, supported by a positive perception of the collaborative and productive relationship between PT POMI users and suppliers (4.47). Two other indicators, namely Risk Management in the Supply Chain (4.25) and Information Technology in SCM (4.23), also showed significant contributions to the smooth operation of the supply chain. Meanwhile, the Performance Company (Y) variable obtained an average score of 4.12, reflecting that PT POMI's operational performance was considered good by suppliers. The Reliability indicator (4.18) was the dominant aspect, with the highest score for the statement related to the ability of the generating unit to operate according to planned capacity (4.28). The Operational Cost (4.11) and Efficiency (4.06) indicators also made positive contributions, although relatively lower, indicating that resource efficiency and cost control remain areas that require continued attention. Overall, these results demonstrate that PT POMI has built solid partnerships, optimized process integration and supply chain management, and maintained strong operational performance. However, improvements in strategic

collaboration, process transparency, and increased efficiency are still needed to support the sustainability of the relationship and long-term competitiveness.

Despite the generally positive perceptions, the gap between high scores in commitment and relatively lower scores in collaboration (4.21) suggests that PT POMI's partnerships, while stable, still operate more as contractual arrangements than fully integrated alliances. Suppliers acknowledged the strong dedication to meeting delivery schedules and quality standards, yet emphasized the limited joint involvement in planning critical functions such as outage scheduling, inventory forecasting, and innovation in procurement strategies. Strengthening co-creation mechanisms such as supplier workshops for forecasting demand, digital integration for live inventory tracking, and shared performance dashboards could enhance alignment, reduce process redundancy, and unlock greater strategic value from these long-term partnerships.

Furthermore, while Process Integration and Supply Chain Management were both rated highly (4.16 and 4.30 respectively), the relatively moderate scores for Supply Chain Visibility (4.12) and Operational Efficiency (4.06) reflect opportunities for further optimization. Many suppliers expressed the need for deeper system interoperability, particularly real-time synchronization between PT POMI's SAP and Maximo platforms and supplier ERP systems, to minimize delays and improve decision-making. By advancing digital transparency and expanding collaborative frameworks beyond operational efficiency toward innovation and risk mitigation, PT POMI can transform its supply chain into a more agile and resilient network, capable of sustaining competitiveness in the face of energy transition pressures and dynamic operational environments.

Measurement Model (Outer ModeI)

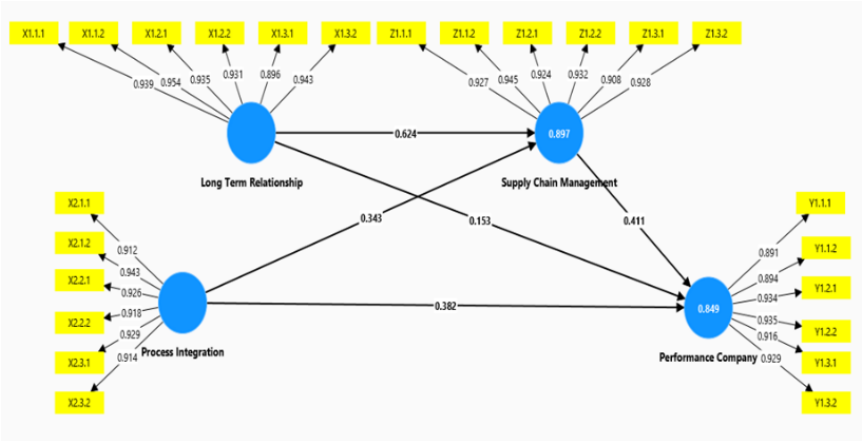

Figure 1. Outer Model Test Results

Evaluation of the measurement model was conducted to ensure that the indicators used in this study were able to reflect the latent constructs validly and reliably. The testing was conducted in three stages: convergent validity, discriminant validity, and reliability. Convergent validity aims to assess the extent to which the indicators used have a high correlation with the construct being measured. Based on the analysis results, all indicators in the variables Long Term Relationship, Process Integration, Supply Chain Management, and Company Performance have loading factor values above 0.70, in accordance with the minimum limit. In addition, each variable showed an Average Variance Extracted (AVE) value above 0.50, which means each construct can adequately explain the variance of its indicator. Thus, all indicators are declared to meet the criteria for convergent validity.

Discriminant validity was performed to ensure that each construct in the model could be empirically distinguished from the others. One of the benchmarks used was a comparison of the indicator loading values against the original construct and other constructs, as well as the magnitude of the AVE value. The test results showed that all variables had AVE values greater than 0.50, indicating that the indicators in each construct were unique and did not overlap. Thus, this model has met the criteria for discriminant validity, and each construct can be interpreted separately without any problems of multicollinearity between constructs.

Furthermore, the strong validity indicators across all constructs demonstrate that the measurement items were well-aligned with the theoretical foundations of the study, minimizing risks of measurement bias and construct misrepresentation. The fulfillment of both convergent and discriminant validity not only strengthens the robustness of the measurement model but also ensures that the subsequent structural analysis can accurately capture the causal relationships being tested. This alignment underscores that the indicators used are conceptually

sound and empirically supported, providing a solid basis for the analysis of how Long-Term Relationship and Process Integration influence Supply Chain Management and Company Performance.

Table 3. Validity Test Results

Variabel	Item Indikator	Loading Faktor	AVE
Long Term Relationship	X1.1.1	0.939	0.871
	X1.1.2	0.954	
	X1.2.1	0.935	
	X1.2.2	0.931	
	X1.3.1	0.896	
	X1.3.2	0.943	
Process Integration	X2.1.1	0.912	0.853
	X2.1.2	0.943	
	X2.2.1	0.926	
	X2.2.2	0.918	
	X2.3.1	0.929	
	X2.3.2	0.914	
Supply Chain Management	Z1.1.1	0.927	0.860
	Z1.1.2	0.945	
	Z1.2.1	0.924	
	Z1.2.2	0.932	
	Z1.3.1	0.908	
	Z1.3.2	0.928	
Performance Company	Y1.1.1	0.891	0.827
	Y1.1.2	0.891	
	Y1.2.1	0.894	
	Y1.2.2.	0.934	
	Y1.3.1	0.916	
	Y1.3.2	0.929	

Construct reliability was measured using Composite Reliability and Cronbach's Alpha values, where a construct is considered reliable if both values exceed 0.70. The test results indicate that all constructs in this study meet these criteria, meaning that the indicators in each construct have high internal consistency. Overall, the results of the evaluation of this measurement model indicate that all latent variables and their indicators have met convergent validity, discriminant validity, and reliability, so that the model is declared suitable for use in the next stage of structural analysis, such as testing the relationships between variables (inner model) and testing the research hypothesis.

These findings confirm that the measurement model provides a solid foundation for further structural analysis, as the reliability and validity metrics indicate minimal risk of measurement error affecting the results. Ensuring such robustness at the measurement level enhances the credibility of the subsequent structural model evaluation and hypothesis testing. This strong measurement integrity also allows the study to draw reliable conclusions regarding the causal relationships between Long-Term Relationship, Process Integration, Supply Chain Management, and Company Performance, while minimizing potential biases that could arise from poorly measured constructs.

Table 5. Results of Latent Variable Reliability Test

Konstrak	*Cronbach's Alpha*	*Composite Reliability*	Keterangan
Long Term Relationship (X1)	0.970	0.971	Reliabel
Process Integration (X2)	0.966	0.966	Reliabel
Supply Chain Management (Z)	0.968	0.968	Reliabel

Performance Company (Y)	0.962	0.963	Reliabel

Structural Model Evaluation (Inner Model)

The results of the structural model evaluation indicate that the relationships between variables in the research model have very high predictive power. Based on the coefficient of determination (R^2) test, the Company Performance variable has an R^2 value of 0.849 with an adjusted R^2 of 0.843, meaning that 84.9% of the variation in company performance can be explained by the Long-Term Relationship and Process Integration variables. Meanwhile, the Supply Chain Management (SCM) variable recorded an R^2 of 0.897 with an adjusted R^2 of 0.894, indicating that 89.7% of the variation in SCM is explained by these two independent variables. With adjusted R^2 values exceeding 0.75, both results indicate that the model has very strong predictive ability. This result is further supported by the predictive relevance (Q^2) value of 0.984, which is close to 1, thus assessing the model's very high predictive relevance for endogenous variables.

These statistical results indicate that the research model not only demonstrates strong explanatory power but also high robustness in predicting the behavior of key operational variables within PT POMI's supply chain ecosystem. The combination of high R^2 and Q^2 values suggests that the model is well-suited for practical application in monitoring and improving company performance through SCM optimization. Moreover, the strong predictive capability underscores that Long-Term Relationship and Process Integration are reliable drivers of SCM effectiveness and company performance, making the model a valuable decision-support tool for managerial strategies aimed at enhancing operational efficiency and competitiveness

Beyond its explanatory strength, the model's robustness also highlights the potential for its use in scenario-based forecasting and performance simulation. By leveraging the high R^2 and Q^2 values, PT POMI's management can simulate the potential impact of varying levels of Long-Term Relationship quality or Process Integration maturity on SCM efficiency and, ultimately, company performance. For example, incremental improvements in supplier collaboration—such as implementing joint outage planning or expanding real-time information sharing can be quantitatively assessed for their projected contributions to key metrics like Equivalent Availability Factor (EAF), Forced Outage Rate (FOR), and operational cost efficiency. This capability can help management prioritize initiatives with the highest projected return on operational reliability and competitiveness.

Additionally, the model's strong predictive validity supports its use as a diagnostic tool for identifying weak points in PT POMI's supply chain network. For instance, deviations in SCM performance indicators, when analyzed through the model, can help isolate whether performance issues stem more from relational factors (such as low trust or limited collaboration with suppliers) or structural factors (such as gaps in system integration and process alignment). This diagnostic application allows PT POMI to tailor its interventions—whether by renegotiating supplier engagement strategies or investing in advanced ERP/SCM technologies—to achieve the most efficient and impactful improvements across its supply chain operations.

Table 6. R-Square (R^2) Test Results

	R-*Square*	R-*Square adjusted*
Performance Company	0.849	0.843
Supply Chain Management	0.897	0.894

The results of the hypothesis test indicate differences in the strength of influence between variables. The Long Term Relationship variable does not have a significant effect on Supply Chain Management (p value = 0.216), indicating that the existence of long-term relationships alone is not enough to increase the effectiveness of SCM at PT POMI. Conversely, Process Integration has a significant positive effect on SCM ($p < 0.001$), confirming the importance of process integration in strengthening the supply chain. Furthermore, Supply Chain Management has a significant effect on Company Performance ($p = 0.010$), proving that the effectiveness of supply chain management contributes directly to improving company performance, including aspects of efficiency, reliability, and cost management. In addition, Long Term Relationship ($p < 0.001$) and Process Integration ($p = 0.003$) also have a direct effect on Company Performance, indicating that both play an important role in directly driving company performance.

These findings also reveal that Supply Chain Management acts as a partial mediator in strengthening the impact of Long Term Relationship and Process Integration on Company Performance. While both variables show significant direct effects on performance, their influence becomes more substantial when channeled through an effective SCM framework, as evidenced by the stronger mediation effect of LTR ($p = 0.008$) compared to PI ($p = 0.015$). This suggests that long-term partnerships can only yield optimal benefits when embedded within collaborative and data-driven SCM practices, such as joint planning, KPI monitoring, and real-time information sharing. Without such integration, long-term agreements risk remaining transactional and fail to enhance resilience, flexibility, and operational excellence.

These results underscore the strategic necessity for PT POMI to elevate its Long-Term Agreements (LTA) beyond a transactional framework by embedding collaboration and technology-driven practices into its supplier relationships. Establishing mechanisms such as integrated outage planning systems, digital dashboards for KPI monitoring, and automated data-sharing platforms can transform LTR into a driver of supply chain resilience and agility. Such initiatives not only enhance trust and transparency but also allow both PT POMI and its suppliers to respond proactively to operational disruptions, ultimately improving plant reliability and cost efficiency.

Furthermore, the greater mediation effect of LTR compared to PI suggests that relationship management carries untapped potential for performance gains when synergized with SCM processes. While PI already delivers tangible improvements by streamlining workflows and enhancing cross-functional visibility, LTR can unlock additional strategic value by fostering joint innovation initiatives, risk-sharing mechanisms, and long-term capacity planning with suppliers. Combining these relational and structural strategies within a robust SCM framework positions PT POMI to achieve sustained competitive advantage, particularly as the energy sector faces mounting pressures from policy shifts, market volatility, and environmental mandates.

Table 7. Results of Direct & Indirect Effect Tests

No	Hubungan Antar Variabel	Jenis Efek	Original Sample (O)	T Statistics	P Values
1	*Long Term Relationship → Supply Chain Management*	*Direct Effect*	0.153	1.237	0.216
2	*Process Integration → Supply Chain Management*	*Direct Effect*	0.624	8.382	0.000
3	*Supply Chain Management → Performance Company*	*Direct Effect*	0.382	2.585	0.010
4	*Long Term Relationship → Performance Company*	*Direct Effect*	0.343	4.487	0.000
5	*Process Integration → Performance Company*	*Direct Effect*	0.411	2.931	0.003
6	*Long Term Relationship → Supply Chain Management → Performance Company*	*Indirect Effect*	0.256	2.671	0.008
7	*Process Integration → Supply Chain Management → Performance Company*	*Indirect Effect*	0.238	2.436	0.000

The mediation effect analysis shows that Supply Chain Management plays a crucial role in strengthening the influence of exogenous variables on company performance. Long-term relationships significantly influence company performance through SCM mediation (p = 0.008), meaning their influence will be more optimal if managed within an effective supply chain system. The same applies to Process Integration, where its influence on company performance is also significantly mediated by SCM (p = 0.015). Overall, the results of this study confirm that Process Integration and Supply Chain Management are the main factors in improving PT POMI's performance, while Long-Term Relationships have a more significant impact when integrated into effective SCM management.

The results of this study confirm that the effectiveness of supply chain management (SCM) at PT POMI is influenced by process integration and long-term relationships, with SCM playing a crucial role as a strategic link to company performance. The findings indicate that long-term relationships have not provided an optimal contribution to SCM effectiveness because they are still dominated by administrative relationships, minimal planning collaboration, and limited real-time information sharing. This contradicts the Relational View theory which emphasizes the importance of trust, information transparency, and process alignment as the foundation of strategic partnerships. Conversely, process integration has been shown to have a positive impact on SCM with the support of integrated information systems (SAP and Maximo), which enable comprehensive visibility, accelerated procurement, and improved cross-functional coordination, in line with the SCOR concept and Dynamic Capabilities Theory.

The study also found that SCM has a significant impact on company performance, particularly in improving efficiency, supply reliability, and controlling operational costs. Digital integration in procurement and distribution processes has been shown to support accelerated decision-making, reduced lead times, and improved key performance indicators such as Equivalent Availability Factor (EAF) and heat rate control. Furthermore, both long-term relationships and process integration have shown a significant impact on company performance, both directly and indirectly through SCM. Long-term relationships have a stronger impact when managed through a collaborative SCM system, while process integration provides optimal performance contributions when facilitated by responsive and structured SCM management.

Theoretically, these findings support the Relational View, Transaction Cost Economics (Williamson, 1985), and the SCOR and Dynamic Capabilities approaches, which emphasize that long-term collaboration and process integration are only effective when supported by scalable, adaptive, and digital SCM mechanisms. These findings also align with previous research by [22], which shows that internal integration and long-term partnerships only provide strategic value when facilitated by real-time information sharing and goal alignment.

Practically, PT POMI is advised to strengthen the strategic dimension of long-term relationships through trust-building, digital information exchange, and supplier involvement in demand planning. The company also needs to expand process integration from the operational to the strategic level, optimizing ERP and SCM to monitor partner performance and key processes such as emergency procurement, logistics distribution, and outage planning. A selective and adaptive approach is crucial to ensure that integration and collaboration do not create rigidity but instead support the company's efficiency, flexibility, and competitive advantage.

Furthermore, the results of this study also indicate the need to redefine the role of long-term relationships to function as strategic partnerships rather than simply contractual relationships. The lack of supplier involvement in the demand planning and risk management stages results in collaborations that are unable to anticipate supply uncertainty, such as disruptions to the global logistics chain and fuel price volatility. Previous research by [23] emphasized that strategic partnerships based on trust and joint planning can increase supply chain resilience, ultimately reducing the risk of operational disruptions and more manageable costs. Therefore, PT POMI needs to shift its focus from merely cost-based relationships to value-based partnerships by building long-term alignment with key suppliers.

Furthermore, strengthening process integration also requires an end-to-end visibility approach that encompasses not only procurement and operations flows, but also asset management and predictive maintenance. Currently, utilizing SAP and Maximo helps accelerate procurement processes and minimize operational delays, but integration with advanced analytics and the Internet of Things (IoT) can provide predictive visibility into asset conditions and critical material availability. This approach aligns with the Industry 4.0 Supply Chain Framework, which emphasizes the importance of using real-time data and AI-based predictions to improve supply chain resilience and efficiency. Thus, process integration focuses not only on speed and coordination but also on predictive capabilities and more proactive adaptation to market and operational dynamics.

4. CONCLUSION

Based on the results of the data analysis and discussion, this study concludes that the effectiveness of Supply Chain Management (SCM) at PT POMI cannot rely solely on the presence of Long-Term Relationships (LTR) with suppliers. For such partnerships to generate strategic value, they must be supported by robust system integration, real-time information transparency, and active collaboration, transforming the relationship from a purely administrative arrangement into a value-creating alliance. In contrast, Process Integration (PI) demonstrates a consistently significant role in enhancing SCM effectiveness. Cross-functional coordination—particularly among procurement, engineering, and operations—enables better visibility of requirements, streamlines workflows, reduces lead times, and enhances overall supply chain agility. Optimally managed SCM contributes directly to improvements in company performance by increasing operational efficiency, strengthening plant reliability, and controlling operational costs. Beyond their direct impact, both LTR and PI influence company performance indirectly through SCM, confirming SCM's position as a strategic mediator that links relational and structural factors to operational outcomes. These findings highlight the critical need for PT POMI to adopt a holistic SCM strategy that prioritizes collaborative frameworks, deep process integration, and adaptive management of long-term partnerships. Furthermore, the results emphasize the necessity of embedding dynamic monitoring mechanisms—such as digital dashboards, performance analytics, and joint review forums—to ensure that long-term agreements remain flexible and that integrated processes adapt effectively to fluctuations in market demand, regulatory changes, and technological advancements. By institutionalizing these adaptive practices, PT POMI can transform its supply chain relationships and process integration initiatives into enduring strategic advantages, ultimately strengthening its competitiveness, operational sustainability, and resilience amidst the global energy transition.

5. REFERENCES

[1] Kementerian ESDM. (2024). Statistik Ketenagalistrikan 2023 (p. 80).

[2] IEA. (2022). Southeast Asia Energy Outlook 2022. In Southeast Asia Energy Outlook 2022. https://doi.org/10.1787/10bc5730-en

[3] Ali, E., Jianhua, L., Rasheed, M., & Siraj, A. (2023). Measuring the impact of integration practices on firms' supply chain performance: role of organizational antecedents in this relationship. Arab Gulf Journal of Scientific Research, 41(3), 293–314. https://doi.org/10.1108/AGJSR-10-2022-0232

[4] Christian, L., Tarigan, Z. J. H., Siagian, H., Basana, S. R., & Jie, F. (2024). The influence of supply chain integration on firm performance through lean manufacturing, green supply chain management and risk management. Uncertain Supply Chain Management, 12(4), 2699–2712. https://doi.org/10.5267/j.uscm.2024.5.002

[5] Hendijani, R., & Saeidi Saei, R. (2020). Supply chain integration and firm performance: the moderating role of demand uncertainty. Cogent Business and Management, 7(1). https://doi.org/10.1080/23311975.2020.1760477

[6] Jiang, F., Isa, F. M., Ng, S. P., & Bhatti, M. (2023). The Impact of Supply Chain Integration to Supply Chain Responsiveness in Chinese Electronics Manufacturing Companies. SAGE Open, 13(4), 1–19. https://doi.org/10.1177/21582440231219070

[7] Kim, S., & Kim, C. (2024). Enhancing Logistics Performance through Increased Trust and Collaboration in Supply Chain Risk Management: A Focus on the Distribution Network of Manufacturing Companies. Systems, 12(4). https://doi.org/10.3390/systems12040141

[8] Owot, G. M., Okello, D. M., Olido, K., & Odongo, W. (2023). Trust-supply chain performance relationships: unraveling the mediating role of transaction cost attributes in agribusiness SMEs. Frontiers in Sustainable Food Systems, 7. https://doi.org/10.3389/fsufs.2023.1113819

[9] Qian, C., Dion, P. A., Wagner, R., & Seuring, S. (2023). Efficacy of supply chain relationships – differences in performance appraisals between buyers and suppliers. Operations Management Research, 16(3), 1302–1320. https://doi.org/10.1007/s12063-023-00354-3

[10] Acocella, A., Caplice, C., & Sheffi, Y. (2024). Great Expectations: The Moderating Effects of Supplier Service Model and Market Dynamics on Relational Contract Performance. Production and Operations Management, 33(11), 2121–2138. https://doi.org/10.1177/10591478241277463

[11] Chae, S., Choi, T. Y., & Hoetker, G. (2024). Theorizing the governance of direct and indirect transactions in multi-tier supply chains. Journal of Supply Chain Management, 60(2), 3–21. https://doi.org/10.1111/jscm.12318

[12] Farida, N., Joseph, N., Sheila, N., Levi, K., & Moses, M. (2024). Asset specificity, relational governance, firm adaptability and supply chain integration. Modern Supply Chain Research and Applications, 6(1), 2–30. https://doi.org/10.1108/mscra-09-2022-0021

[13] Ali, A., & Mahfouz, A. (2025). Building dynamic resilience capabilities for supply chain disruptions: insights from the Irish food industry. International Journal of Logistics Research and Applications, 5567, 1–29. https://doi.org/10.1080/13675567.2025.2480628

[14] Ratna Ayu Wulandari, Meylisa Haristi, & Yoel Santo Andrianus Sormin. (2024). Improving service supply chain performance with the Supply Chain Operations Reference (SCOR) approach; Case study: Indonesia government testing laboratory. World Journal of Advanced Research and Reviews, 22(3), 742–756. https://doi.org/10.30574/wjarr.2024.22.3.1678

[15] Harahap, A. K., & Marie, I. A. (2025). the Effect of Supply Chain Integration, Agility, Sustainability on Supply Chain Performance Mediated By Supply Chain Robustness and Resilience in Logistics Companies in Java Island. Indonesian Interdisciplinary Journal of Sharia Economics (IIJSE), 8(2), 4724–4744.

[16] Qureshi, K. M., Mewada, B. G., Kaur, S., Alghamdi, S. Y., Almakayeel, N., Almuflih, A. S., & Qureshi, M. R. N. M. (2023). Sustainable Manufacturing Supply Chain Performance Enhancement through Technology Utilization and Process Innovation in Industry 4.0: A SEM-PLS Approach. Sustainability (Switzerland), 15(21). https://doi.org/10.3390/su152115388

[17] Santosa, W., & Dewayana, T. S. (2024). The Influence Of Supply Chain Digitalization On Integration And Agility In Company Performance Ikrima. Indonesian Interdisciplinary Journal of Sharia Economics (IIJSE), 7(3), 7852–7869.

[18] Chirumalla, K., Oghazi, P., Nnewuku, R. E., Tuncay, H., & Yahyapour, N. (2025). Critical factors affecting digital transformation in manufacturing companies. International Entrepreneurship and Management Journal, 21(1). https://doi.org/10.1007/s11365-024-01056-3

[19] Marjerison, R. K., Jun, J. Y., & Kim, J. M. (2025). The Moderating Effects of Operations and Supply Chain Issues on Digital Readiness, Value Creation, and Firm Satisfaction. Systems, 13(5), 1–24. https://doi.org/10.3390/systems13050369

[20] Kusviansyah, F. R., & Ardi, R. (2024). Integrated Supply Chain Quality Management and an Organizational Performance Insights: a two-stage PLS-SEM and Artificial Neural Network (ANN) approach. Jurnal Indonesia Sosial Teknologi, 5(6), 3006–3024. https://doi.org/10.59141/jist.v5i6.1167

[21] Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2021). Design-and-Managing-The-Supply-Chain-Concepts-Strategies-and-Case-Studies-David-Simchi-Levi-Edisi-1-2000. In McGraw-Hill Higher Education (pp. 8–15).

[22] Baah, C., Opoku Agyeman, D., Acquah, I. S. K., Agyabeng-Mensah, Y., Afum, E., Issau, K., Ofori, D., & Faibil, D. (2022). Effect of information sharing in supply chains: understanding the roles of supply chain visibility, agility, collaboration on supply chain performance. Benchmarking, 29(2), 434–455. https://doi.org/10.1108/BIJ-08-2020-0453

[23] Chopra, S., & Meindl, P. (2016). Supply Chain Management: Global Edition. In Pearson Education Limited. https://books.google.com/books/about/Supply_Chain_Management.html?id=l6oItAEACAAJ.R

[24] Acocella, A., Caplice, C., & Sheffi, Y. (2024). Great Expectations: The Moderating Effects of Supplier Service Model and Market Dynamics on Relational Contract Performance. Production and Operations Management, 33(11), 2121–2138. https://doi.org/10.1177/10591478241277463