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The Influence of Information and Communication Technology and Supply Chain Management on Organizational Performance through Operational Performance in Container Expedition Service Companies

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A B S T R A C T

This study aims to analyze the influence of Information and Communication Technology (ICT) and Supply Chain Management (SCM) on Organizational Performance with Operational Performance as an intervening variable in a Container Services Company. Data was collected through a questionnaire to 150 employees in the operational and logistics fields, then analyzed using the Partial Least Square–Structural Equation Modeling (PLS-SEM) quantitative method through SmartPLS. The results of the study show that ICT and SCM have a positive effect on organizational performance, and Operational Performance mediates the relationship between the two and Organizational Performance. These findings affirm the importance of effective technology support and logistics systems in increasing productivity and work achievement, while making a practical contribution to management in designing performance improvement strategies based on operational strengthening.

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INTRODUCTION

In the era of globalization, business dynamics are undergoing a rapid transformation driven by technological advancements, digitalization, and global market integration. The increasing intensity of competition requires companies to adopt innovative and efficient strategies. Among the most important aspects in modern business are the optimization of supply chain management (SCM) and the use of information and communication technology (ICT). ICT, through digital devices such as the Internet of Things (IoT), big data analytics, and artificial intelligence (AI), has revolutionized logistics operations by enabling automation, increasing transparency, and accelerating the distribution process. However, many organizations still face challenges in realizing end-to-end systems integration and consistent deployment.

In Indonesia, the logistics sector plays a vital role in supporting national economic growth. Large ports serve as the main node of supply chain effectiveness, with the Port of Tanjung Perak in Surabaya being one of the largest distribution centers for domestic and international trade. Despite its strategic role, the port has experienced a number of operational challenges in recent years. Container shipping companies operating at the port reported a decrease in loading and unloading volumes, both inter-island and international, between 2022 and 2023. Internal reports also indicate inefficiencies such as delivery delays, declining order numbers, and increasing average delivery time.

One of the companies facing this problem is Jasa Ekspedisi Peti Kemas, a national shipping company that has been operating in the Indonesian logistics industry for a long time. Despite having an extensive branch network and fleet of ships, the company has experienced a decline in operational performance in the past three years. Interviews with employees show that many problems are related to the out-of-sync ICT system between divisions, reliance on inefficient manual processes, and limited access to real-time data. These barriers not only lower operational performance, but also impact organizational productivity and employee motivation.

Theoretically, ICT and SCM are seen as key factors in improving organizational performance. ICT supports efficient information management, strengthens decision-making processes, and is the foundation for digital integration in the logistics sector. Meanwhile, SCM is a strategic approach that coordinates the flow of goods, information, and resources from suppliers to end customers, to ensure accuracy, responsiveness, and efficiency. Various previous studies have confirmed the positive contribution of ICT and SCM to organizational performance. However, most of these studies still analyze the influence of ICT and SCM separately. There are still limited studies that emphasize the role of operational performance as a mediating variable in explaining how ICT and SCM together affect organizational performance, especially in the logistics services sector.

This research aims to fill this gap by empirically examining the relationship between ICT, SCM, operational performance, and organizational performance in the context of container expedition service companies in Indonesia, through a case study on Jasa Ekspedisi Peti Kemas operating at

Tanjung Perak Port. Using a quantitative approach and Partial Least Squares – Structural Equation Modeling (PLS-SEM) analysis, this study evaluates both the direct and indirect influence of ICT and SCM on organizational performance through operational performance as a mediating variable.

The contribution of this research covers three main aspects. First, enriching the literature with empirical evidence related to the role of operational performance mediation in the relationship between ICT and SCM – organizational performance. Second, it provides a specific context for the logistics sector in Indonesia, a crucial industry that is still rarely researched in the context of developing countries. Third, it offers practical implications for logistics managers and policymakers in designing organizational performance improvement strategies through the integration of digital technologies and supply chain management practices.

LITERATURE REVIEW

Information and Communication Technology (ICT)

Information and Communication Technology (ICT) refers to a set of digital tools and infrastructure that support the processing, storage, and dissemination of data to improve organizational efficiency and decision-making (Laudon & Laudon, 2020; Bourgeois, 2021). In the context of logistics, ICT enables automation, real-time tracking, integration between stakeholders, and transparency in the supply chain (Suriyanti et al., 2025; Yuliana et al., 2022). Previous research has shown that the adoption of ICT significantly improves operational efficiency, delivery accuracy, and service quality (Mulyadi et al., 2024; Zhu, Guo, & Zou, 2022). However, the effectiveness of ICT is highly dependent on its suitability to the organization's tasks as well as the capabilities of users, as described in the DeLone & McLean IS Success Model.

Supply Chain Management (SCM)

Supply Chain Management (SCM) is defined as the strategic coordination of the flow of materials, information, and finance from suppliers to end customers to maximize value and competitive advantage (Chopra & Meindl, 2021; Heizer et al., 2020). Effective SCM can lower costs, minimize lead times, and improve customer satisfaction through the integration of logistics, procurement, production, and distribution (Wisner et al., 2022). Previous research has emphasized that SCM practices, including inventory availability, product variety, and collaboration with suppliers, significantly improve organizational agility and innovation capabilities (Firmansyah & Siagian, 2022; Alfalla-Luque et al., 2023). However, in developing countries, SCM implementation often faces obstacles such as fragmented systems and weak collaboration between companies.

Kinerja Operasional (Operational Performance/OP)

Operational performance is a measure of the effectiveness and efficiency of business processes, especially in terms of productivity, quality, cost efficiency, and delivery reliability (Neely et al., 2020; Heizer & Render, 2021). In the logistics

industry, operational performance is heavily influenced by the application of ICT and SCM practices, which determine inventory management, forecasting accuracy, and distribution effectiveness (Lee et al., 2023). A number of studies show that operational performance plays a mediating variable in the relationship between supply chain strategy and organizational results (Hailu et al., 2023; Vo et al., 2024). However, studies that emphasize the role of this mediation in the logistics services sector are still limited.

Organizational Performance/OPP

Organizational performance reflects the extent to which the company achieves its financial and market goals through effective strategies and operations (Karimi & Rafiee, 2021; Anwar & Abdullah, 2021). This performance can be evaluated with both financial and non-financial indicators, such as service quality, innovation, delivery speed, and adaptability (Bhatti, 2014). Previous empirical research has shown that ICT and SCM make a significant contribution to organizational performance (Irwansyah, 2023; Ridwan et al., 2024). However, most of these studies analyzed ICT and SCM separately, so there is still a gap in the study of how they together affect organizational performance through operational performance.

Research Gaps

Although previous research has confirmed the positive influence of ICT and SCM on company performance, empirical evidence on the mediating role of operational performance is limited, particularly in the logistics services sector in developing countries. Most studies still treat ICT and SCM as separate constructs, without exploring their combined impact on organizational performance. To fill this gap, this study examines how ICT and SCM affect organizational performance through operational performance, with a focus on container forwarding service companies in Indonesia.

METHODOLOGY

Research Design

This study uses a quantitative approach with a positivism paradigm to empirically test the relationship between Information and Communication Technology (ICT), Supply Chain Management (SCM), Operational Performance (OP), and Organizational Performance (OPP). This approach was chosen because it allows the measurement of causal relationships between latent variables through statistical testing of hypotheses.

Population and Sample

The object of the research is Jasa Ekspedisi Peti Kemas, a container shipping company operating at the Port of Tanjung Perak, Surabaya. The research population includes employees working in the operations and logistics divisions. With the purposive sampling technique, 150 respondents were obtained representing employees who were directly involved in the operational process.

Data Collection

Primary data were collected through a structured questionnaire on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The research instrument was adapted from indicators that had been validated in previous studies to guarantee the validity of the construct. Before deployment, the questionnaire was pre-tested to ensure the clarity of the questions and reliability.

Variables and Measurements

1. Independent Variables:
   - Information and Communication Technology (ICT), measured by indicators of system completeness, ease of use of technology, and mastery of information systems by employees (Sembiring et al., 2021).
   - Supply Chain Management (SCM), measured through indicators of inventory availability, product variety, competitive prices, and product quality (Abdillah et al., 2022).
2. Mediation Variables:
   Operational Performance (OP), evaluated based on forecasting accuracy, resource planning, operational efficiency, inventory planning, process time reduction, cost savings, and cost calculation accuracy (Lee et al., 2023).
3. Variable Dependency:
   Organizational Performance (OPP), measured through internal operating indicators, product quality, timeliness of delivery, technological innovation, and adaptability (Bhatti, 2014).

Data Analysis

Data analysis was carried out using Partial Least Squares – Structural Equation Modeling (PLS-SEM) with the help of SmartPLS software. This method was chosen because it is able to estimate the complex causal relationships between variables and is suitable for small to medium sample sizes. The stages of analysis include:

Evaluation of Measurement Models (Outer Model)

- Reliability tested via Composite Reliability (CR) and Cronbach's Alpha.
- Convergent validity was evaluated using Average Variance Extracted (AVE).
- Discriminant validity was tested with Fornell–Larcker and Heterotrait–Monotrait Ratio (HTMT) criteria.

Evaluation of Structural Models (Inner Model)

- Calculating the path coefficient and R-square value to assess the power of the model.
- Model fit test is performed using Goodness-of-Fit (GoF).
- Hypothesis testing was carried out using the bootstrapping technique of 5,000 subsamples to assess significance.

Ethical Considerations

Respondents' participation is voluntary and the confidentiality of answers is guaranteed. All data is used for academic purposes only.

RESEARCH RESULT

Outer Model (Data Measurement and Validity Model)

The Outer Model functions as a validity and reliability tester with four types of measurements, namely convergent validity, discriminant validity, composite reliability, and cronbach alpha.

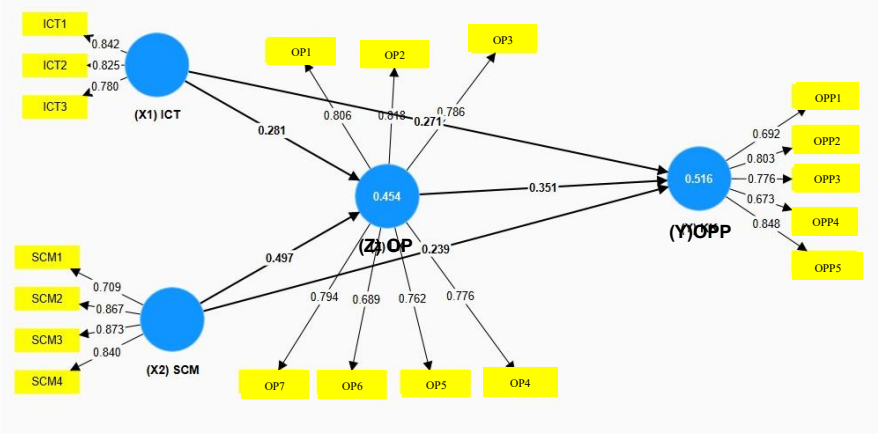

Figure 1. Model PLS

Source: Smart PLS Data Processing 4.0 (2025)

Convergent Validity

In this study, a convergent validity test was carried out on four variables, namely Information and Communication Technology (X1), Supply Chain Management (X2), Organizational Performance (Y), and Operational Performance (Z). Based on the results of data processing using SmartPLS software, all indicators in each construct show an outer loading value that exceeds the threshold of 0.50, as shown in Table 1. next

Table 1. Results of Outer Loading (Factor Loading)

	(X1) ICT	(X2) SCM	(Y) OPP	(Z) OP
ICT1	0,842			
ICT2	0,825			
ICT3	0,780			
OPP1			0,692	
OPP2			0,803	
OPP3			0,776	
OPP4			0,673	
OPP5			0,848	
OP1				0,806
OP2				0,818
OP3				0,786
OP4				0,776
OP5				0,762

OP6				0,689
OP7				0,794
SCM1		0,709		
SCM2		0,867		
SCM3		0,873		
SCM4		0,840		

Source: Processing via SmartPLS (2025)

From the results of the table above, it can be seen that all indicators have an outer loading value above 0.50, which means that each indicator can explain the variables it measures quite well. For example, in the ICT variable (X1), the ICT1 indicator has the highest loading value of 0.842, indicating that the indicator has a significant contribution in representing information technology constructs. Similarly, on the SCM variable (X2), the SCM3 indicator showed the highest correlation strength with a value of 0.873, indicating that supply chain efficiency is well represented. Likewise, in the Organizational Performance (Y) variable, all indicators showed adequate convergent validity, with the highest loading value on the OPP5 indicator of 0.848. Meanwhile, in the Operational Performance (Z) variable, the OP2 indicator has the highest loading of 0.818, which indicates a strong emotional attachment and commitment to the organization.

In general, these results confirm that all constructs in the measurement model are reflective and meet the requirements of convergent validity. Therefore, the indicators used in this study can be declared valid in representing their respective variables.

Discriminant Validity

There are three common approaches used to assess discriminant validity, namely through Fornell-Larcker Criterion analysis, Heterotrait-Monotrait Ratio (HTMT), and Cross Loading.

Fornell-Larcker Criterion

Table 2. Outer Loading (Fornell-Larcker Criterion)

	(X1) ICT	(X2) SCM	(Y) OPP	(Z) OP
(X1) ICT	**0.816**			
(X2) SCM	**0.461**	**0.825**		
(Y) OPP	**0.560**	**0.584**	**0.762**	
(Z) OP	**0.510**	**0.626**	**0.639**	**0.777**

Source: Processing via SmartPLS (2025)

From the table, it can be seen that the root of AVE for each construct is at a higher value compared to its correlation value to other constructs. For example, the variable Information and Communication Technology (ICT) has an AVE root of 0.816, which is greater than its correlation with the variables Supply Chain Management (0.461), Organizational Performance (0.560), and Operational Performance (0.510). This indicates that the ICT construct is better able to explain its own variables than others, which means that the discriminant validity is met.

Similarly, other constructs such as Supply Chain Management (SCM) with an AVE root of 0.825 also have higher values than their correlation with other constructs, for example with Organizational Performance (0.584) and Operational Performance (0.626). Likewise, the constructs of Organizational Performance (OPP) and Operational Performance (OP) show the same pattern. So, the results of the Fornell-Larcker Criterion analysis in this study confirm that each construct has good discriminant validity, that is, each construct is able to distinguish itself from other constructs in the research model.

Heterotrait-Monotrait Ratio (HTMT)

Table 3. HTMT Test Results

Heterotrait-monotrait ratio (HTMT) – Matrix

	(X1) ICT	(X2) SCM	(Y) OPP	(Z) OP
(X1) ICT				
(X2) SCM	**0.570**			
(Y) OPP	**0.717**	**0.663**		
(Z) OP	**0.612**	**0.669**	**0.733**	

Source: Processing via SmartPLS (2025)

All HTMT values are below 0.90, so it can be concluded that the Supply Chain Management (SCM), Information and Communication Technology (ICT), Organizational Performance (OPP), and Operational Performance (OP) constructs have met the requirements for discriminatory validity based on the HTMT approach. For example, the HTMT value between SCM and Organizational Performance is 0.663, and between ICT and Operational Performance is 0.612.

From the explanation above, this shows that each construct is able to distinguish itself from the other constructs without significant overlap. Thus, all constructs in this study have good discriminant validity based on the HTMT method.

Cross Loading

Table 4. Cross Loading Results

Cross loadings

	(X1) ICT	(X2) SCM	(Y) OPP	(Z) OP
ICT1	0.842	0.343	0.440	0.426
ICT2	0.825	0.365	0.430	0.459
ICT3	0.780	0.419	0.501	0.361
OPP1	0.401	0.390	0.692	0.333
OPP2	0.516	0.501	0.803	0.462
OPP3	0.342	0.386	0.776	0.570
OPP4	0.425	0.354	0.673	0.501
OPP5	0.442	0.567	0.848	0.545

OP1	0.480	0.661	0.580	0.806
OP2	0.316	0.452	0.456	0.818
OP3	0.384	0.438	0.499	0.786
OP4	0.458	0.551	0.539	0.776
OP5	0.344	0.408	0.469	0.762
OP6	0.321	0.373	0.355	0.689
OP7	0.417	0.441	0.522	0.794
SCM1	0.388	0.709	0.306	0.338
SCM2	0.268	0.867	0.406	0.416
SCM3	0.500	0.873	0.588	0.591
SCM4	0.347	0.840	0.543	0.629

Source: Processing via SmartPLS (2025)

Table 4 shows the results of cross loading of indicators for each research variable. Based on the table, all indicators have the highest correlation value to the construct they represent compared to other constructs. This condition indicates that each indicator does specifically reflect the construct in question and does not overlap with other constructs. For example, the SCM3 (Supply Chain Management) indicator has a correlation of 0.873 with the SCM construct, while the correlation with other constructs such as Organizational Performance, Operational Performance, and ICT is below that value. The same thing also happens with the OPP2 (Organizational Performance) indicator which shows the highest correlation of 0.803 with the Organizational Performance construct, compared to other constructs with lower values

From this explanation, the results of this cross loading test corroborate the previous findings of the discriminatory validity test using the FornellLarcker and HTMT methods. All constructs, namely Information and Communication Technology (ICT), Supply Chain Management (SCM), Organizational Performance (OPP), and Operational Performance (OP), have met the requirements for discriminatory validity. This means that the measurement model used in this study is able to clearly distinguish each construct, making it suitable for use in future analysis.

Composite Reliability

Table 5. Composite Reliability and AVE Results

Construct reliability and validity

Overview

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
(X1) ICT	0.749	0.749	0.857	0.666
(X2) SCM	0.848	0.884	0.894	0.681
(Y) OPP	0.816	0.827	0.873	0.580
(Z) OP	0.891	0.900	0.914	0.603

Source: Processing through SmartPLS (2025)

Based on the table, all variables have a composite reliability above the threshold of 0.7, which indicates a high level of consistency. For example, the Supply Chain Management (SCM) variable has a composite reliability of 0.894, which indicates that the indicators used are very consistent and reliable to measure the construct. Other variables such as Organizational Performance and Operational Performance also showed similar results, reinforcing the reliability of the measurements.

At AVE values, all variables are also eligible with values above 0.5. For example, the Operational Performance variable obtained an AVE value of 0.603, indicating that the construct is able to adequately explain most of its indicator variants. This also applies to other variables, including ICT, SCM, and Organizational Performance. Thus, it can be concluded that all variables in this study have a good level of reliability and convergent validity, making them suitable for further analysis.

Cronbach Alpha

In this study, the test results showed that all variables had Cronbach's alpha values that were above this limit, indicating that the indicators in each variable were consistent in measuring the construct in question. For example, the Operational Performance variable obtained a Cronbach's alpha value of 0.891, while ICT obtained a value of 0.749. These two numbers confirm that the variable has an adequate level of reliability to support the validity of the research results.

Overall, the reliability test using Cronbach's alpha reinforces the belief that the measurement instruments in this study are reliable and have good internal consistency.

Inner Model (Model Structural)

Table 6. R-Square Results

R-square

Overview

	R-square	R-square adjusted
(Y) OPP	0.516	0.506
(Z) OP	0.454	0.447

Source: Processing via SmartPLS (2025)

The R-Square value is used to assess the strength of the structural model. The higher the value, the better the independent construct explains the dependent variable. Here's the explanation:

- (Y) Organizational Performance has an R-square value of 0.516, meaning that 51.6% of the variation in Organizational Performance can be explained by ICT and SCM variables. The remaining 48.4% is influenced by other factors not described in this model.
- (Z) Operational Performance has an R-square value of 0.454, which means that 45.4% of the variation in Operational Performance is explained by the variables ICT, SCM, and Organizational Performance. While 54.6% of the

variation is explained by other external factors that are not included in the model.

In general, the R-square values of the two dependent variables are in the moderate to strong category, so this model can be said to have good explanatory abilities for the variables studied. In addition to R-Square, structural models are also evaluated using Q-Square (Predictive Relevance). Predictive relevance is a test that is carried out in showing how good the observation value is produced using the blindfolding procedure by looking at the Q square value. If the Q square value is > 0, it can be said to have a good observation value, while if the Q square value is < 0, then it can be stated that the observation value is not good. Q-Square predictive relevance for structural models, measures how well the observation value is produced by the model and also the estimation of its parameters.

A Q-square value > 0 indicates the model has predictive relevance; conversely, if the Q-Square value ≤ 0 indicates the model lacks predictive relevance. The Q2 quantity has a value with a range of 0 < Q2 < 1, where the closer it is to 1 the better the model. This Q2 quantity is equivalent to the total determination coefficient in the path analysis.

Q-Square can measure how well the observation value is produced by the model and also the estimation of its parameters (Ghozali, 2016). A Q-Square value greater than 0 (zero) indicates that the model has a predictive relevance value. Meanwhile, if the Q-Square value is less than 0 (zero), then the model lacks or has no predictive relevance. The predictive relevance value is obtained by the formula (Hair, 2013):

$$Q2 = 1 – (1 – R12) (1 – R22) …. (1 – Rn2)$$

Where are the values of R12, R22... Rn2 is the R-Square value of the endogenous variable in the model.

Based on the R-Square value in Table 4.16 above, the QSquare value using the Stone-Geisser Q Square Test formula is as follows (Ghozali, 2016):

$$Q2 = 1 – (1 – R12) (1 – R22)$$
$$Q2 = 1 – (1 – 0,516) (1 – 0,454)$$
$$Q2 = 0,735$$

The result of the Q-Square calculation in this study is 0.735 or 73.5%, thus it can be concluded that the model in this study has a relevant predictive value, where the model used can explain the information in the research data by 73.5%. Next, you can see the path coefficient in the inner model.

Uji Goodness of Fit (GoF)

Goodness of Fit (GoF) is an index used to measure the overall quality of structural models in research. This value shows how well the model is able to explain the data, taking into account the validity of the measurements (via AVE) and the strength of the prediction (via R-Square). The higher the GoF value, the better the model is at describing the relationships between constructs:

$$GoF = \sqrt{Average\ AVE\ x\ R^2}$$

The following calculation to find the average value of AVE and R-Square, according to the table below.

Table 6. AVE & R-Square Average Results

Konstruk	AVE	R-Square
ICT (X1)	0.666	–
Supply Chain Management (X2)	0.681	–
Organizational Performance (Y)	0.580	0.516
Operational Performance (Z)	0.603	0.454
Rata-rata	**0.6325**	**0.485**

Source: PLS Processing Results (2025)

Based on the AVE and *R-Square values* in the table above, the Goodness of *Fit (GoF)* is calculated as follows:

$$GoF = \sqrt{Average\ AVE\ x\ R^2}$$

$$GoF = \sqrt{0.6325\ x\ 0.485}$$

$$GoF = \sqrt{0.3065}$$

GoF = 0.5537

A GoF value of 0.554 indicates that this model is in the "large" category, as it is above the threshold of 0.36 as stated by Tenenhaus et al. This means that the research model has good quality overall, both in terms of construct validity *(outer model*) and predictive ability *(inner model*). With the GoF value, it can be concluded that the model built in this study is quite strong and feasible to be used in explaining the relationship between variables, namely between ICT, SCM, *Organizational Performance*, and *Operational Performance*.

Uji Hypothesis

Table 7. Direct Effect Hypothesis Test Results

Path coefficients

Mean, STDEV, T values, p values

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
(X1) ICT -> (Y) OPP	0,271	0,274	0,083	3,266	0,001
(X2) SCM -> (Y) OPP	0,239	0,237	0,108	2,213	0,027

Source: Processing via SmartPLS (2025)

Table 7 shows the results of the hypothesis test for the direct influence between the variables in this study:

- H1: Information and Communication Technology has a positive and significant effect on Organizational Performance. A coefficient value of 0.271 with a p-value of 0.001 (less than 0.05) indicates that H1 is accepted. This means that the application of ICT effectively contributes significantly to the improvement of Organizational Performance in Container Expedition Services.
- H2: Supply Chain Management has a positive and significant effect on Organizational Performance. A coefficient value of 0.239 and a p-value of 0.027 (less than 0.05) indicate that H2 is also accepted. This means that good supply chain management has a significant effect on Organizational Performance.

The next test is indirect influence testing. The following are the results of the indirect influence test of this study:

Table 8. Indirect Effect Hypothesis Test Results

Specific indirect effects

Mean, STDEV, T values, p values

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
(X1) ICT -> (Z) OP -> (Y) OPP	0,099	0,099	0,041	2,387	0,017
(X2) SCM -> (Z) OP -> (Y) OPP	0,174	0,179	0,067	2,622	0,009

Source: Processing via SmartPLS (2025)

Based on the table above, the results of the hypothesis test can be described as follows:

- H3: Operational Performance mediates the influence between Information and Communication Technology and Organizational Performance. The indirect effect value of 0.099 with a p-value of 0.017 shows that the effect is significant. Thus, H3 is accepted. This shows that Operational Performance strengthens the influence of ICT on Organizational Performance.
- H4: Operational Performance mediates the influence between Supply Chain Management and Organizational Performance. An indirect effect value of 0.174 with a p-value of 0.009, which is also smaller than 0.05, indicates that H4 is acceptable. This means that Operational Performance is an important factor in channeling the influence of SCM on improving organizational performance.

DISCUSSION

Influence Information and Communication Technology to Organizational Performance

The results of the study show that Information and Communication Technology (ICT) has a positive effect on Organizational Performance in container expedition service companies. Effective use of ICT speeds up work processes, reduces manual errors, and creates a more structured system. The most dominant indicator is the completeness of computer equipment, which employees consider to be very helpful in daily activities and increase productivity.

These findings are closely related to the characteristics of respondents, the majority of young employees with bachelor's education who are used to using technology and have high expectations for digital work facilities. These results strengthen the Technology Acceptance Model which emphasizes the importance of ease of use and benefits of technology, as well as the Resource-Based View which sees ICT as a source of strategic excellence for companies.

This study is consistent with previous studies (Mulyadi et al., 2024; Ridwan et al., 2024) which proves the role of ICT in increasing work effectiveness. The implementation of ICT in Container Expedition Services, such as container tracking systems and digital document management, has been proven to improve time efficiency, service accuracy, and coordination between divisions.

The implication is that companies need to continue to strengthen ICT infrastructure, not only hardware but also integrated applications, accompanied by regular training for employees. Thus, ICT functions not just as a tool, but as a strategic factor in building a digital work culture and improving organizational performance.

The Influence of Supply Chain Management on Organizational Performance

The results of the study show that Supply Chain Management (SCM) has a positive and significant effect on Organizational Performance in container forwarding service companies. Optimal SCM makes the work process more structured, planned, and supports performance quality improvement.

The most dominant indicator was the availability of inventory, which respondents assessed as a key factor for smooth work. Maintained stock makes it easier for employees to complete tasks without the hindrance of supply delays, increase productivity, and reduce stress due to uncertainty. This is especially felt by the operational and trucking divisions that depend most on smooth distribution.

These findings are in line with the theory of the Value Chain (Porter) and the Job Demands-Resources Model, which emphasizes that the availability of logistics resources can improve motivation, efficiency, and operational performance. The results of the study are also consistent with Widodo & Silitonga (2019) and Alfalla-Luque et al. (2023) who show that supply chain efficiency is closely related to labor productivity.

Digital-based SCM implementations in enterprises, such as real-time inventory monitoring, have been proven to strengthen coordination between divisions, accelerate decision-making, and improve uptime efficiency.

The Influence of Information and Communication Technology on Organizational Performance through Operational Performance

The results of the analysis show that Operational Performance plays an important role as a mediator in the relationship between Information and Communication Technology (ICT) and Organizational Performance. This means that ICT not only has a direct impact on performance, but also improves organizational performance through operational efficiency.

The most dominant ICT indicator is the completeness of technological devices (computers, printers, networks, and software), which provides ease of work while creating psychological comfort because the company is considered to support employee productivity. Meanwhile, on the operational side, the strongest indicator is the reduction of production time, which reflects efficiency thanks to the use of smart technology and an integrated supply chain system.

The majority of respondents of productive age (26–35 years old) show high adaptation to technology, so the existence of modern ICT systems strengthens operational performance and work loyalty. These findings are in line with the Technology Acceptance Model and Organizational Commitment Theory, which emphasize that technology support can increase emotional attachment as well as employee long-term commitment.

In practice, the use of digital systems such as container tracking and cloud-based logistics management has increased efficiency, accuracy, and employee trust in the company. The managerial implication is that companies need to continue to strengthen ICT infrastructure along with training and employee involvement so that the benefits of technology can be optimized. Thus, ICT plays a dual role: directly improving work performance, while indirectly strengthening operational performance that drives organizational productivity.

The Influence of Supply Chain Management on Organizational Performance through Operational Performance

The results of the analysis show that Operational Performance plays an important role as a mediator in the relationship between Supply Chain Management (SCM) and Organizational Performance. Effective SCM not only improves organizational performance directly, but also strengthens operational performance.

The most dominant SCM indicator is the availability of inventory, which employees consider to be very helpful in the smooth running of daily tasks, creating a sense of comfort, and strengthening trust in the company. From an operational point of view, the strongest indicator is the reduction in production time, which reflects the efficiency of the distribution process and job satisfaction.

The majority of respondents from the operations and logistics divisions—although most are still new—show high productivity because they feel the benefits of an organized SCM system. These findings are consistent with the Value Chain (Porter) theory and are supported by the study of Zhu et al. (2022) which affirm that SCM efficiently improves competitiveness and company performance. The real implementation can be seen from the use of real-time container tracking systems, inventory control, and accurate shipping scheduling.

The managerial implication is that companies need to strengthen the SCM system not only as an operational mechanism, but also as a human resource development strategy through training and competency improvement. Thus, a good SCM not only improves direct work efficiency, but also builds operational performance as a bridge to increased organizational productivity.

CONCLUSIONS AND RECOMMENDATIONS

Conclusion

This study aims to analyze the influence of Information and Communication Technology (ICT) and Supply Chain Management (SCM) on Organizational Performance (OPP) with Operational Performance (OP) as a mediating variable in container forwarding service companies in Indonesia.
Based on the results of the analysis, the following conclusions were obtained:

- ICT has a positive and significant effect on Organizational Performance. The effective use of technology speeds up the work process, reduces manual errors, and creates a more structured system. The most dominant indicator is the completeness of computer devices that support employee productivity.
- SCM has a positive and significant effect on Organizational Performance. A good supply chain management system, especially in the aspect of inventory availability, improves the smooth work, accuracy, and job satisfaction of employees.
- Operational Performance mediates the relationship between ICT and Organizational Performance. ICT not only improves organizational performance directly, but also through increased operational efficiency.
- Operational Performance also mediates the relationship between SCM and Organizational Performance. Effective SCM strengthens operational performance, which in turn drives organizational productivity.

Thus, this study confirms that ICT and SCM are key factors that improve organizational performance, both directly and indirectly through improving operational performance.

Recommendation

Based on the results of the research, there are several practical and academic recommendations:

Practical Implications

- Strengthening ICT: Companies need to continue to develop ICT infrastructure, both hardware and integrated digital applications. Additionally, regular training is important to ensure employees are able to make optimal use of technology.
- SCM optimization: Inventory management systems must be kept stable through accurate demand planning, periodic evaluation, and the use of digital technology for real-time monitoring.
- Improved Operational Performance: Operational efficiency can be strengthened through digitization of work processes, reduction of production time, and data integration between divisions.

- HR development: Companies need to connect ICT and SCM strengthening with HR development strategies so that employees feel supported, motivated, and committed to the organization.

Academic Implications

This research provides an empirical contribution by emphasizing the role of Operational Performance as a mediating variable between ICT, SCM, and Organizational Performance. Further studies are recommended to expand the research object on other logistics companies or different sectors in order to obtain broader generalizations. Longitudinal research is recommended to capture the dynamics of the influence of ICT and SCM on organizational performance in the long term.

ADVANCED RESEARCH

Further research is suggested to add other variables such as the Internet of Things (IoT), Artificial Intelligence (AI), Warehouse Management System (WMS), and Port Community System (PCS) that have the potential to affect Operational Performance and Organizational Performance. In addition, it is important to expand the research location and respondent profiles, for example by including similar companies in different locations or sectors, as well as paying attention to external factors such as changes in customs regulations and global supply chain disruptions due to the pandemic or geopolitical conflict. To obtain more in-depth results, future research may also use a longitudinal approach to look at long-term performance changes, or qualitative studies to explore a more comprehensive perspective.

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