

The Mediating Role of Supply Chain Capability in Customer Integration and Operational Performance

Abidatul Ulya¹, Muhammad Hamdi¹, Aftoni Sutanto¹, Zaki Amirul Amri¹, Dini Andriani¹,
Muhammad Iqbal Fauzi¹

¹Ahmad Dahlan University, Yogyakarta, Indonesia

Corresponding Author: ulyaabidatul21@gmail.com

Abstract. *The purpose of this study was to examine the mediating role of supply chain capability in the micro-café industry in the Special Region of Yogyakarta on the influence of customer integration on operational performance. This study used a quantitative approach with a survey method, with 154 respondents who were both customers and employees of the café business. Data were collected using a structured questionnaire and analyzed using a causal relationship modeling approach based on latent variables to examine the long-term and short-term effects between variables. The results of this study indicate that customer integration influences operational performance. Furthermore, supply chain capability have been shown to have a positive impact on operational performance and serve as a mediator in the relationship between customer integration and operational performance. This indicates that collaboration and customer information exchange influence operational efficiency and accuracy. This study concludes that customer integration, supported by strong supply chain skills, has a positive impact on the operational performance of small and medium enterprises. This impact is reflected in the increased ability of business actors to efficiently manage the flow of goods, information, and resources, thereby optimally improving operational performance.*

Keywords: Customer Integration, Supply Chain Capabilities, Operational Performance, MSMEs

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INTRODUCTION

Operational performance is a key factor determining an organization's ability to achieve competitive advantage in the market. This concept encompasses a company's efficiency and effectiveness in managing costs, maintaining quality, increasing process flexibility, and meeting customer needs in a timely manner (Saragih et al., 2020). Good operational performance indicates the extent to which a company is able to optimize resources to maintain product quality and respond quickly to changes in market demand.

Mawuntu & Aotama. (2022), in the context of Micro, Small, and Medium Enterprises (MSMEs), this aspect is crucial for business sustainability because it directly impacts productivity, customer satisfaction, and profitability (Ramadhani et al., 2025). Research shows that MSMEs with high operational performance tend to have production and distribution systems that are adaptive to market fluctuations and able to maintain consistent service quality (Tandelilin & Munajah, 2022). Therefore, improving operational performance is a strategic priority that must

be strengthened through process efficiency and effective relationships with customers (Jahroni et al., 2025).

Amidst increasingly fierce global competition, companies can no longer rely solely on internal efficiency, but must build close collaboration with all parties in their supply chain (Dubey et al., 2021; Ivanov, 2020; Mawuntu & Aotama, 2022) Rapid changes in market demand and supply uncertainty make supply chain management a strategic element of competitive advantage. (Manik et al., 2022) One key approach is supply chain integration, namely the alignment of internal and external activities with partners such as customers and suppliers (Pradabwong et al., 2017). Good integration allows organizations to increase information visibility, accelerate responses to demand fluctuations, and reduce inefficiencies in distribution and production.

However, several studies in developing countries show that the impact of integration on operational performance is not always consistent because it is influenced by internal factors such as organizational capability and the level of digitalization (Dubey et al., 2021; Tumpa et al., 2019). One important factor believed to strengthen this relationship is supply chain capability, namely the company's ability to manage information, logistics activities, and market responses adaptively (Siagian et al., 2024) Companies with high capability are able to optimize the benefits of customer integration through data-driven decision-making, efficient cross-functional coordination, and the use of information technology (Rahmawati et al., 2022).

Conversely, organizations with low capability tend to fail to translate integration into operational excellence. Thus, supply chain capability acts as an intermediary mechanism that transforms customer information into increased productivity and operational timeliness (Huo et al., 2016). Every business category, including Micro, Small, and Medium Enterprises (MSMEs), has a primary focus within its structure and provides 97% of the country's workforce and more than 60% of GDP Ministry of Cooperatives and SMEs, 2024. However, a number of circumstances, including the availability of financial resources, affect them all during this period of growth and development.

In fact, one of the real barriers hindering critical thinking is the availability of work methods and free time. This impacts the global middle class and related business challenges, particularly for MSMEs. According to (Hidayat et al., 2024), this results in low competitiveness and an inability to compete with large businesses that have implemented digital supply chain (Ikrima et al., 2024). Especially in the Special Region of Yogyakarta (DIY), the culinary and cafe MSME sector is growing rapidly, with the number of businesses increasing by around 18% by 2024, according to the Yogyakarta Cooperatives and MSMEs Office (Irwan et al., 2025).

This growth is driven by increased tourism activity and the adoption of digital platforms such as GoFood and GrabFood. However, this growth has not been fully accompanied by increased operational efficiency. Many MSME cafes still face problems such as delays in raw material supplies, inconsistent product quality, and limited understanding of customer preferences. This condition indicates weak information sharing and coordination practices in the supply chain, which impacts low operational performance (Firmansyah & Siagian, 2022) In addition, low customer integration in business processes also reflects weak supply chain capability, which ultimately reduces efficiency and competitiveness (Hanggara et al., 2019).

In this context, customer integration is a strategic factor for MSMEs in the Special Region of Yogyakarta (DIY) to improve operational performance. Customer integration reflects the organization's ability to build communication and collaboration with customers regarding product quality requests, planning, and feedback (Panahifar et al., 2018). When customers are actively involved, companies obtain more accurate market information, thereby increasing the accuracy of production planning and efficient procurement of raw materials (Hani'aturrofidha et al., 2025; Wajdi et al., 2023). Research Hanggara et al.(2019) shows that customer, integration has a positive impact on supply chain flexibility and operational performance of MSMEs.

Strong customer relationships accelerate information flow, improve demand forecast accuracy, and lower operational costs Hanggara et al (2019). Consistently, customer collaboration and integration within the supply chain have been shown to improve operational efficiency, including production time and product quality consistency, and strengthen supply chain capability as a key mediating mechanism for improving a company's operational performance (Rahman & Martadisastra, 2022; Wajdi et al., 2023).

Supply chain capability describes a company's ability to efficiently manage the flow of goods, information, and resources to respond to market changes (Dubey et al., 2021). Companies with high capability are able to align production capacity with demand, minimize raw material delays, and maintain quality customer service. Research by Panahifar et al. (2018) confirms that, strong supply chain capability strengthen the relationship between customer integration and improved operational performance. This means that the better a company's ability to manage its supply chain, the greater the positive impact of customer integration on operational efficiency, timeliness, and quality (Falahat et al., 2020; Saragih et al., 2020).

Based on the above description, this study focuses on the relationship between employee integration and operational performance, both directly and through the use of supply chain mediation capability in MSMEs in the Special Region of Yogyakarta. This research was conducted because there is still a lack of empirical research examining employee integration in improving MSME operational performance through supply chain capability (Raza & Khan, 2025). It is hoped that the findings of this study will provide theoretical contributions to the supply chain management literature and practical contributions for MSME cafe users in the self-managed (DIY) sector in improving productivity, service quality, and business competitiveness.

Literature Review and Hypothesis Development

Customer Integration

Customer integration is a crucial aspect of supply chain integration because it emphasizes collaboration and information exchange between companies and customers. This approach ensures active customer involvement in the planning, product development, and performance evaluation processes, enabling a more accurate understanding of market needs (Jermisittiparsert et al., 2019) In the MSME sector, customer integration is crucial for improving efficiency and service quality, given that resource constraints make them dependent on long-term customer relationships Hanggara et al.(2019), found that customer integration in supply chain processes directly improves MSME operational efficiency. Other studies by (Ruzo Sanmartín et al., 2023; Siagian et al., 2021) also found that customer engagement strengthens innovation capability and cross-functional coordination, thus positively impacting supply chain performance. Findings from Hanggara et al. (2019), research on MSMEs in the Special Region of Yogyakarta also confirm that customer integration significantly impacts performance through improved communication, demand management, and the ability to adjust production capacity to market needs. Overall, previous research consistently shows that customer integration has a positive impact on operational performance, both directly and through the ability of the supply chain as a mediator. This is in line with the results of previous research Ruzo Sanmartín et al. (2023), which confirmed that customer integration can improve supply chain efficiency through increased collaboration, information exchange, and the ability to respond more quickly to market dynamics.

Supply Chain Capability

Supply chain capability refers to an organization's ability to efficiently manage the flow of goods, information, and resources to respond to market changes Saragih et al (2020). Companies with strong supply chain capability are able to adjust their production capacity to demand fluctuations, minimize supply delays, and maintain service quality (Masa'deh et al., 2022). Research Firmansyah & Siagian. (2022), shows that supply chain integration, including customer integration, plays a crucial role in enhancing innovation capability in MSMEs, thus positively

impacting operational performance. Furthermore, findings Subburaj et al. (2020) reinforce that the quality of supply chain management and external integration significantly influence the operational efficiency of MSMEs, particularly in the food manufacturing sector. Recent research by Fauzi et al. (2023), also found that supply chain capability is a mediating variable that strengthens the influence of customer integration on operational performance. Thus, improving supply chain capability is an important strategy for MSMEs to adapt to market uncertainty and maintain competitiveness (Masa'deh et al., 2022; Saragih et al., 2020).

Operational Performance

Operational performance is the extent to which an organization can execute its operations efficiently and accurately to achieve its strategic objectives. In the context of supply chain management, operational performance includes process efficiency, service delivery time, customer service time, and the ability to respond quickly to market changes (Lee, 2021). Analyzing operational performance is crucial because it serves as an indicator of how well the supply chain strategy is being implemented. Operational performance also serves as a measure of a company's ability to achieve competitiveness through cost efficiency, profitability, and productivity. According to Munir et al. (2020), this demonstrates how risk management practices and supply chain integration can improve operational efficiency by enhancing internal and external coordination. Furthermore, Haryanto & Santosa. (2022) emphasize that a company's ability to serve customers in a superior and differentiated manner is a key source of competitive advantage, which is demonstrated in operational performance. Effective operational performance not only drives internal efficiency but also fosters successful collaborative relationships with the external supply chain.

Hypothesis Development

The Effect of Customer Integration on Supply Chain Capability

According to the Resource-Based View (RBV) theory (Barney, 1991), competitive advantage stems from a company's ability to manage valuable, rare, difficult-to-imitate, and non-substitutable internal resources. In this context, supply chain capability are strategic resources that enable companies to create operational efficiency. Customer integration acts as an external mechanism that enhances these internal resources, as through collaborative relationships and information exchange, companies can develop supply chain capability that are more adaptive to changing market demand. Customer integration reflects an organization's ability to build collaborative relationships and share information with customers to improve supply chain effectiveness. According to Ma'ruf. (2025), process integration and intensive communication with customers strengthen internal and external coordination within the supply chain. Furthermore, research on MSMEs in Indonesia shows that customer integration has a positive impact on supply chain flexibility and operational performance. Therefore, the higher the customer integration, the stronger the company's supply chain capability, thus supporting the achievement of competitive advantage.

H1: Customer integration has a positive impact on supply chain capability.

The Influence of Supply Chain Capability on Operational Performance

Supply chain capability, which encompass efficient information flow, logistics, and resource management, are critical factors in improving a company's operational performance. From the Resource-Based View (RBV) perspective (Barney, 1991) these capability are viewed as valuable and difficult-to-imitate strategic internal resources that can create competitive advantage. Empirical research on MSMEs in Indonesia shows that supply chain integration and operational digitalization play a role in strengthening these capability and positively impact operational performance. Di Vaio et al. (2021) found that supply chain integration, agility, and innovation significantly improve company performance. Furthermore, Hani'aturrofidha et al. (2025) Subburaj et al. (2020) Wajdi et al. (2023), demonstrated that operational digitalization

strengthens supply chain integration, which in turn increases MSME operational efficiency and flexibility sustainably.

H2: Supply chain capability have a positive impact on operational performance.

The Effect of Customer Integration on Operational Performance

Customer integration plays a crucial role in improving a company's operational performance by providing accurate and timely market information. Strong customer relationships enable companies to increase efficiency, effectiveness, and accuracy in production and procurement planning. Several studies have shown that MSMEs with high levels of customer integration have greater operational agility and optimal operational performance, particularly in the dynamic culinary and cafe sectors (Faturrahman & Nursyamsiah, 2024; Firmansyah & Siagian, 2022; Wajdi et al., 2023). This finding aligns with the Resource-Based View (RBV) perspective (Barney, 1991), which emphasizes that leveraging valuable and difficult-to-imitate strategic resources, including customer relationships, is fundamental to improving a company's performance and competitive advantage.

H3: Customer integration has a positive impact on operational performance.

The Mediating Role of Supply Chain Capability on Customer Integration and Operational Performance

The relationship between customer integration and operational performance is often not direct but is strengthened through supply chain capability. Customer integration provides valuable market information and knowledge, while supply chain capability serve as a mechanism that translates this information into effective operational actions. Research shows that supply chain integration, manifested in operational flexibility and capability, has a significant positive impact on operational performance (Masa'deh et al., 2022). Similar findings were also found in the context of MSMEs in Indonesia, where supply chain integration supported by agility and innovation can strengthen operational performance (Faturrahman & Nursyamsiah, 2024). This view aligns with the Resource-Based View (RBV) theory, which emphasizes that supply chain capability are strategic internal resources formed from accumulated knowledge, experience, and collaboration with external partners, thus transforming external relationships into operational excellence.

H4: Supply chain capability mediate the effect of customer integration on operational performance.

Conceptual Framework

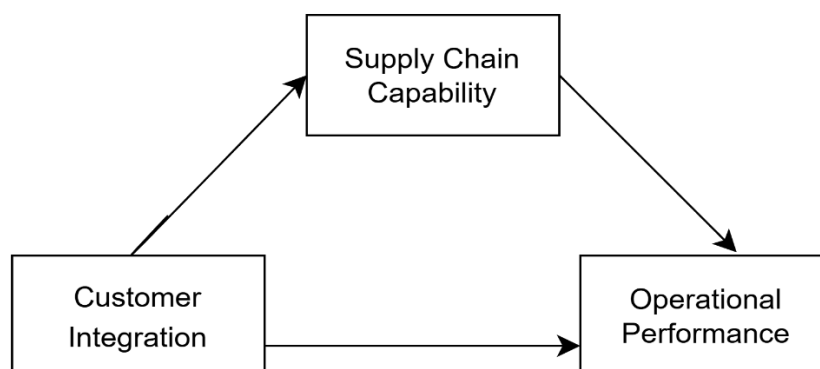


Figure 1. Conceptual Framework

Figure 1. Describes the conceptual framework of this study, which examines the effect of customer integration on operational performance, with supply chain capability as a mediating variable. This model consists of four relationship hypotheses. H1 states that customer integration

has a positive effect on supply chain capability, where a better level of integration allows companies to obtain more accurate information, thereby increasing responsiveness in the supply chain process. H2 tests that stronger supply chain capability will contribute to improved operational performance, particularly in terms of efficiency and timeliness. H3 assesses the direct effect of customer integration on operational performance, assuming that optimal customer engagement can drive improvements in service quality and operational processes. Furthermore, H4 explores the role of supply chain capability as a mediator, indicating that customer integration not only has a direct impact on operational performance but also exerts an indirect influence through improved supply chain capability. Overall, this model illustrates that customer integration is an important factor that can strengthen operational performance both directly and through mediating mechanisms.

METHODS

This study used a quantitative survey approach with an exploratory research design, which aims to analyze the relationships between variables in a measurable manner based on numerical data obtained from respondents. This design was chosen because the study not only describes phenomena but also tests hypotheses and the direct and indirect relationships between variables through structural modeling. Quantitative research is used to examine a specific population or sample with the aim of testing predetermined hypotheses through statistical analysis (Sugiyono, 2013). This approach also aligns with Ghozali. (2018) opinion, which states that quantitative methods focus on objectively measuring social phenomena through numerical data analyzed statistically to obtain valid and reliable conclusions. The sample in this study consisted of 154 respondents, who were owners and employees of MSME cafes in the Special Region of Yogyakarta. Owners and employees were selected as respondents because they are directly involved in operational processes, supply chain management, and interactions with customers in the daily activities of MSME cafes. The sampling technique used was purposive sampling, with the following criteria: (1) having worked at least one year in an MSME, (2) understanding of supply chain processes and customer service, and (3) involvement in operational decision-making. This study involved three main variables: customer integration as the independent variable, supply chain capability as the mediating variable, and operational performance as the dependent variable. Each variable was measured using a number of indicators adapted from previous research (Lee, 2021; Zhang et al., 2024). The research instrument was adapted from a previous study and adapted to the context of MSME cafes in the Special Region of Yogyakarta. Adaptations were made by modifying the wording of indicators to be relevant to cafe operational characteristics, such as service speed, coordination of raw material supply, and digital platform-based customer interactions.

The questionnaire was translated into Indonesian and reviewed on a limited basis to ensure item clarity and understanding before widespread distribution. The research instrument used a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). To measure the factors, fifteen questions were used to measure the relationship between customer integration, supply chain capability, and operational performance. To assess respondents' perceptions of each statement, customer integration was assessed with five items adapted from (Kalyar et al., 2020). Supply Chain Capability was assessed with five items adapted from Rajaguru & Matanda. (2019), and operational performance was examined with five items adapted from (Hong et al., 2019). A sample size of 154 respondents was deemed adequate for Partial Least Squares–Structural Equation Modeling (PLS-SEM) analysis. Based on the rule of ten, the minimum sample size is determined as ten times the maximum number of structural paths leading to a construct (Cheah & Hair, 2025). In this study, the maximum number of paths leading to a construct is two, resulting in a minimum sample size of 20 respondents. Therefore, a sample size of 154 respondents exceeds the minimum limit and is considered sufficient to produce stable and reliable estimates. Data analysis was conducted using Partial Least Squares–Structural Equation Modeling (PLS-SEM) with the aid of SmartPLS software version 4.0. The first stage was the evaluation of the

measurement model (outer model), which aimed to test convergent validity, discriminant validity, and construct reliability. The second stage was the evaluation of the structural model (inner model) to examine the relationships between constructs through path coefficients, R^2 values, and direct and indirect effects. Hypothesis testing was conducted based on p-values with a 5 percent significance level.

RESULTS AND DISCUSSION

The results in Table 1 show that the total number of respondents was 154, consisting of 58.4% male and 41.5% female. The majority of respondents were aged 18–25 years (64.2%), followed by those aged 25–30 years (25.9%), 30–35 years (5.8%), and those aged 35 years and older (3.8%). Based on work experience, the majority of respondents (62.9%) had worked for less than 3 years, while 29.8% had worked for 3–5 years, and 7.1% had 6–10 years of work experience. In terms of monthly income, the majority of respondents (67.5%) were in the Rp1,000,000–Rp2,999,999 category, followed by 29.8% in the Rp3,000,000–Rp5,999,999 category, and 2.5% in the Rp6,000,000–Rp9,999,999 category. Overall, this demographic description provides a general overview of the profile of the respondents involved in this study, in accordance with the data collected through the questionnaire.

Table 1. Respondent Characteristics

Characteristic	Category	Frequency	Percentage
Gender	Male	90	58.4%
	Female	64	41.5%
	Total	154	100%
Age	18–25 years	99	64.2%
	25–30 years	40	25.9%
	30–35 years	9	5.8%
	> 35 years	6	3.8%
	Total	154	100%
Length of Employment	< 3 years	97	62.9%
	3–5 years	46	29.8%
	6–10 years	11	7.1%
	Total	154	100%
Income	IDR 1,000,000 – IDR 2,999,999	104	67.5%
	IDR 3,000,000 – IDR 5,999,999	46	29.8%
	IDR 6,000,000 – IDR 9,999,999	4	2.5%
	Total	154	100%

Source: Processed research data

Variable Measurement

Initial analysis was conducted by evaluating the measurement model to ensure that the research instrument met validity and reliability standards, as shown in Figure 2. Construct validity was assessed through the outer loading values for each indicator. The test results showed that most indicators in the Supply Chain Capability (SCC) and Operational Performance (OP) variables had outer loading values above 0.70, reflecting the indicator's strong contribution in measuring the construct. For the Customer Integration (CI) variable, several indicators had outer loading values in the range of ≥ 0.60 . These values are acceptable in the PLS-SEM approach, particularly for exploratory research, as recommended by (Hair & Alamer, 2022). Therefore, all indicators in each construct were declared valid and suitable for use in further analysis.

Furthermore, convergent validity was tested using the Average Variance Extracted (AVE) value. The test results show that the AVE value for the Customer Integration (CI) variable is 0.520, Operational Performance (OP) is 0.635, and Supply Chain Capability (SCC) is 0.640. All AVE values

are above the minimum limit of 0.50, indicating that each construct is able to explain more than 50% of the variance of its indicators. Furthermore, discriminant validity was evaluated using the Fornell–Larcker criteria. The test results showed that the square root of the AVE value for each construct was higher than the correlation between other constructs, so it can be concluded that each construct has an adequate level of difference and is able to measure different concepts clearly. Based on the results of the outer loading test, AVE, Fornell–Larcker, and construct reliability, it can be concluded that all constructs in this study have met the criteria for validity and reliability, so that the research instrument is declared suitable for use in structural model analysis in the next stage.

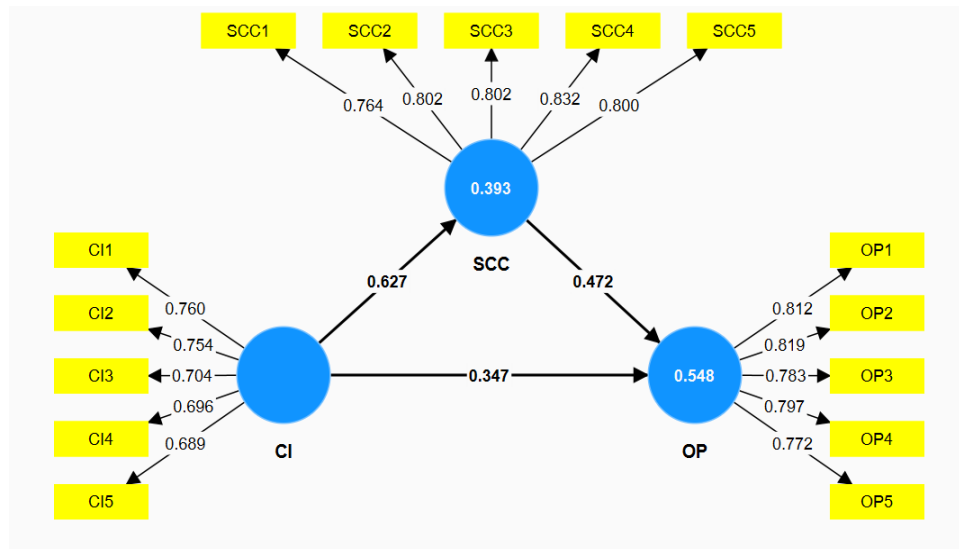


Figure 2. SEM Model of External Loadings (smartPLS output)

Source: SmartPLS 4.0

Discriminant Reliability Values

Based on the reliability test results presented in the table, all research constructs demonstrated Cronbach's Alpha (CA) and Composite Reliability (CR) values above the minimum threshold of 0.70, thus meeting the internal reliability criteria. The Customer Integration (CI) variable had a CA value of 0.769 and a CR of 0.772, indicating adequate indicator consistency. The Operational Performance (OP) variable recorded a Cronbach's alpha (CA) value of 0.857 and a Composite Reliability (CR) of 0.861, indicating a high level of reliability. Furthermore, the Supply Chain Capability (SCC) variable had a Cronbach's alpha (CA) value of 0.860 and a Composite Reliability (CR) of 0.863, indicating that the indicators in this construct are highly consistent in measuring the concept under study.

Table 2. Discriminant Reliability Results

	Cronbach's Alpha (CA)	Composite Reliability (CR)	Average Variance Extracted (AVE)
CI	0,769	0,772	0,520
OP	0,857	0,861	0,635
SCC	0,860	0,863	0,640

Source: Data Discriminant Reliability (SmartPLS 4.0)

Thus, it can be concluded that all constructs in this study are reliable and suitable for use in subsequent structural model analysis. These test results are expected to provide readers with confidence that the research instruments used meet methodological standards, allowing for

accurate interpretation of subsequent research findings and serving as a reference for research and managerial practice in related fields.

R-Square Value

Based on the analysis results in Table 3, the R-Square value for the Operational Performance (OP) variable is 0.548, with an Adjusted R-Square value of 0.542. These results indicate that 54.8% of the variation in operational performance can be explained by the Customer Integration (CI) and Supply Chain Capability (SCC) variables simultaneously, while the remaining 45.2% is influenced by factors outside the research model. This R-Square value indicates that the model has fairly strong explanatory power. Furthermore, the Supply Chain Capability (SCC) variable has an R-Square value of 0.393 and an Adjusted R-Square value of 0.389. This indicates that 39.3% of the variation in supply chain capability can be explained by the Customer Integration (CI) variable, while the remaining 60.7% is influenced by factors outside the model. Based on general PLS-SEM criteria, this value falls into the moderate category, indicating that customer integration has a significant impact on improving supply chain capability.

Table 3. R-Square Value Results

	R-Square	R-Square adjusted
OP	0,548	0,542
SCC	0,393	0,389

Source: R-Square Value Data (SmartPLS 4.0)

The results of the R-Square value provide readers with an overview that the research model has a fairly good explanatory ability in explaining variations in Supply Chain Capability and Operational Performance, so that the relationship between the variables tested can be considered relevantly in managerial decision making and further research development.

Fornell-Lacker Criterion Values

The Fornell-Lacker Criterion is used to assess discriminant validity by comparing the square root of the Average Variance Extracted (AVE) for each construct with its correlation with other constructs (Fornell & Larcker, 1981). Based on the analysis results in Table 4, the square root of the AVE for the Customer Integration (CI) construct is 0.721, Operational Performance (OP) is 0.797, and Supply Chain Capability (SCC) is 0.800. All of these AVE values are higher than the correlation values between the other constructs. This finding indicates that each construct in the research model has good discriminant validity, as each construct is more capable of explaining the variance of its own indicators than its relationship to other constructs.

Table 4. Results of the Fornell-Lacker Criterion Values

	CI	OP	SCC
CI	0.721		
OP	0.643	0.797	
SCC	0.627	0.689	0.800

Source: Fornell-Lacker Criterion Value Data (SmartPLS 4.0)

The results of this discriminant validity test are expected to provide readers with confidence that each construct in the study has been clearly defined and does not overlap, so that the results of the analysis and conclusions of the study can be interpreted more accurately.

Direct and Indirect Test Results

Based on the results of the direct and indirect effect tests presented in Table 5, all relationships between variables demonstrated a T-statistic > 1.96 and a p-value < 0.05, thus all hypotheses were accepted. The effect of Customer Integration (CI) on Supply Chain Capability (SCC) showed a path coefficient of 0.627, with a T-statistic of 11.879 and a p-value of 0.000. These

results indicate that customer integration has a positive and significant effect on improving supply chain capability. The better the customer integration, the greater the ability of MSMEs to manage their supply chain. Furthermore, the effect of Supply Chain Capability (SCC) on Operational Performance (OP) showed a coefficient of 0.472, with a T-statistic of 6.343 and a p-value of 0.000. These findings indicate that supply chain capability has a positive and significant effect on operational performance, indicating that improving supply chain capability can drive operational efficiency and effectiveness.

The direct effect of Customer Integration (CI) on Operational Performance (OP) was also proven significant, with a coefficient value of 0.347, a t-statistic of 4.324, and a p-value of 0.000. This indicates that customer integration can directly improve operational performance without mediating variables. Meanwhile, the indirect effect of CI on OP through SCC showed a coefficient value of 0.296, a t-statistic of 5.616, and a p-value of 0.000, indicating a significant mediation effect. Since both direct and indirect effects were significant, it can be concluded that supply chain capability acts as a partial mediator in the relationship between customer integration and operational performance.

Table 5. Direct and Indirect Test Results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistic (IO/STDEVI)	P Value	Description
CI->SCC	0,627	0,632	0,053	11.879	0,000	Received
SCC->OP	0,472	0,470	0,074	6.343	0,000	Received
CI->OP	0,347	0,350	0,080	4.324	0,000	Received
CI->SCC->OP	0,296	0,297	0,053	5.616	0,000	Received

Source: Path Coefficient, Mean, Standard Deviation, T-Value, p-Value (SmartPLS 4.0)

The results of this study provide an understanding that improving operational performance is not solely dependent on customer integration but is also significantly influenced by the capabilities of the supply chain. Therefore, readers particularly practitioners and researchers are encouraged to consider strengthening supply chain capability as a critical strategy for transforming customer information into effective and sustainable operational decisions.

Total Indirect Effects - Bias-Corrected Confidence Intervals

Based on the results of the Bias-Corrected Confidence Interval test in Table 6, the CI → OP relationship has a lower bound of 0.198 and an upper bound of 0.405. The entire confidence interval range is positive and does not cross zero. This indicates that the indirect effect of customer integration on operational performance is positive and significant. Thus, it can be confirmed that the mediation effect in this research model is statistically valid, where increased customer integration will consistently be followed by increased operational performance through the tested mechanism. This finding confirms the results of previous tests and confirms that the relationship between the variables in the model has a positive and stable direction.

Table 6. Confidence Intervals Bias Corrected

	Bias	2.5%	97.5%
CI->OP	0.001	0.198	0.405

Source: Total Indirect Effects (SmartPLS 4.0)

The Effect of Customer Integration on Supply Chain Capability (H1)

The analysis results indicate that customer integration has a positive and significant effect on supply chain capability, with a path coefficient of $\beta = 0.627$ and a significance value of $p < 0.001$. Therefore, hypothesis H1 is accepted.

The Effect of Supply Chain Capability on Operational Performance (H2)

The analysis results indicate that supply chain capability has a positive and significant effect on operational performance, with a path coefficient of $\beta = 0.472$ and a significance value of $p < 0.001$. Therefore, hypothesis H2 is accepted.

The Effect of Customer Integration on Operational Performance (H3)

The analysis results indicate that customer integration has a positive and significant effect on operational performance, with a path coefficient of $\beta = 0.347$ and a significance value of $p < 0.001$. Therefore, hypothesis H3 is accepted.

The Mediating Role of Supply Chain Capability on Customer Integration and Operational Performance (H4)

The results of the indirect effect test indicate that supply chain capability significantly mediate the effect of customer integration on operational performance, with a path coefficient of $\beta = 0.296$ and a significance value of $p < 0.001$. Therefore, hypothesis H4 is accepted. Based on the magnitude of the path coefficient, the relationship between customer integration and supply chain capabilities is the strongest in the model compared to the other relationships.

Discussion

The Impact of Customer Integration on Supply Chain Capability

The research findings indicate that customer integration plays a crucial role in enhancing the supply chain capability of MSME cafes. Improved communication, information sharing, and collaboration between MSMEs and customers enable businesses to obtain more accurate and real-time demand information, thereby enhancing the supply chain's ability to respond to market changes. This relationship can be explained through the Resource-Based View (RBV), which views customer integration as a valuable, rare, and difficult-to-imitate relational resource (Barney, 1991; Wernerfelt, 1984). When MSMEs are able to strategically leverage these relationships, internal capability such as production flexibility, process coordination, and speed of demand fulfillment can significantly improve. This finding aligns with previous research emphasizing the importance of customer integration in enhancing supply chain effectiveness and capability (Dai et al., 2023; Zhang et al., 2022).

The Influence of Supply Chain Capability on Operational Performance

Supply chain capability have been shown to play a role in improving the operational performance of MSME cafes. The ability to manage supply, respond to demand, and coordinate material requirements enables MSMEs to increase order processing speed, accelerate production, and reduce operational costs caused by process inefficiencies. According to the Resource-Based View (RBV), internal capability are strategic resources that are difficult to imitate and form the basis of an organization's competitive advantage (Barney, 1991). The results of this study are consistent with the findings of (Huo et al., 2016), which showed that companies with strong supply chain capability tend to have more flexible and efficient operational performance, particularly in terms of logistics and response time.

The Influence of Customer Integration on Operational Performance

Customer integration has also been shown to have a direct impact on improving the operational performance of MSME cafes. Good relationships and effective information exchange enable MSMEs to align production capacity, improve operational planning, and enhance service quality. In the context of MSME cafes in the Special Region of Yogyakarta, customer integration is crucial due to high demand volatility, demands for fast service, and reliance on digital ordering platforms. From a RBV perspective, the ability to leverage customer information is an internal capability that supports increased process efficiency and organizational response speed (Barney, 1991). This finding aligns with research by (Subburaj et al., 2020) and (Aslam et al., 2025), which

emphasizes that collaboration and information integration contribute to increased operational effectiveness and efficiency.

The Mediating Role of Supply Chain Capability on Customer Integration and Operational Performance

The results of this study indicate that supply chain capability act as a partial mediator in the relationship between customer integration and operational performance due to the indirect effect between them. Customer integration will have a more optimal impact on operational performance if supported by adequate supply chain capability, such as efficient inventory management, supplier coordination, and service process adjustments. Supply chain capability mediate the relationship between customer integration and operational performance by translating customer information into inventory planning, supplier coordination, and service process adjustments. Supply chain capability enable customer information to be translated into concrete operational actions, including inventory planning, production scheduling, and service quality improvement. This finding is consistent with research by (Wajdi et al., 2023) and (Chaudhuri et al., 2018), which emphasize that supply chain capability strengthen the effectiveness of customer integration in improving operational performance.

Furthermore, the results of this study indicate that information obtained from the audience will be more accurate when it can be translated into appropriate operational actions. Supply chain capability enable MSMEs to respond more quickly to customer needs through more efficient inventory, increased production, and higher service quality. This is in line with research (Chaudhuri et al., 2018) which shows that supply chain capability can increase the effectiveness of customer integration in terms of production speed and process efficiency. Thus, supply chain capability are a critical component that strengthens the relationship between customer integration and operational efficiency.

CONCLUSION

This study shows that customer integration has a positive influence on supply chain capability and operational performance of MSMEs in the Special Region of Yogyakarta. Good relationships with customers help MSMEs obtain accurate market information, thereby improving business process efficiency and demand management, while supply chain capability play a significant role and mediate the effect of customer integration on operational performance. Therefore, MSMEs are advised to strengthen communication and collaboration with customers and improve supply chain capability through inventory management and the use of digital technology to be more efficient and responsive.

SUGGESTION

However, this study is limited to MSMEs in the cafe sector in the Special Region of Yogyakarta, so further research is recommended to expand the sectors and study areas to obtain more comprehensive results.

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