

# Uncertain Supply Chain Management

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## The effect of supply chain operational capabilities in consolidating organizational compatibility of supply chain process integration and business performance

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### ABSTRACT

#### Article history:

Received August 5, 2022  
Received in revised format  
August 26, 2022  
Accepted October 26 2022  
Available online  
November 3 2022

#### Keywords:

Supplier Integration  
Internal Integration  
Customer Relationship  
Management  
Operational Performance  
Business Performance

Medium and large industries are vital businesses that have an important role in economic development and growth in Indonesia, with abundant job opportunities available in these industrial sectors. This study aims to examine the effect of supplier integration, internal integration, and relationship management to customer relationships on operational performance and business performance, and the role of operational performance variables as a mediation. The data taken were 210 respondents involved in various industries in Central Java, Indonesia and then analyzed and processed using IBM SPSS Statistic software version 24 and Smart PLS 3.0 (Smart Partial Least Square). The sampling technique used in this study was purposive sampling. Data obtained directly from respondents who met the characteristics of the population determined by distributing questionnaires. Based on the test analysis results, it was found that the supplier integration, internal integration, and relationship management to customer variables had a significant positive relationship on operational performance and business performance. It was also observed that operational performance mediated the effect of supplier integration, internal integration, and relationship management to customer on business performance.

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### 1. Introduction

In this era of industrial revolution 4.0, the desire of a company to always compete, improve company performance and be successful in the long term has forced companies to establish cooperative relationships with suppliers because it is impossible for a company to produce everything it needs (Liu et al., 2013). According to Bäckstrand & Fredriksson (2022), cooperation with these suppliers has become a must in today's competition where competition occurs in all supply chain networks of a company, and this implies that large companies are very dependent on their smallest partners. To get a supply chain that has flexibility and responsiveness, an organization needs to implement integration with suppliers (Wu et al., 2006).

According to Chakraborty and Ewens (2018) and Goffnett (2018), investment in integration with suppliers has the potential to provide higher operational performance than investment in integration with customers. Several studies have stated that the integration strategy with suppliers will influence improving supply chain performance and competitive advantage (Chen et al., 2009). This is very necessary in facing economic competition in every region such as AFTA (Asean Free Trade Area) since supply chain integration policies can maintain sustainable company growth and earn profits (Birasnav, 2013). This causes companies to always try to operate efficiently and flexibly in their supply chains to be able to compete because it can increase the company's flexibility (Huo et al., 2021; Jacobs & Mafini, 2019; Jermisittiparsert & Srihirun, 2019).

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Some of the research findings of Huo et al. (2021) and Jacobs and Mafini (2019) show that the supply chain management strategy by implementing an integrated system between buyers and suppliers in the company is a strategic choice to be able to compete and produce optimal company performance. Interest in supply chain integration began to grow and was considered important by companies because they saw the opportunities and benefits of supply chain integration relationships. Research on supplier integration shows a positive relationship between supplier integration or overall supply chain integration with operational performance and buyer business performance. According to Shin and Park (2021), Sriyakul et al. (2019), Tarigan et al. (2021) and Teoman and Ulengin (2018), there is a direct relationship between supplier integration and supply chain operational performance. Based on previous theoretical perspectives, this study aims to analyze the relationship between supplier integration, internal integration, and relationship management to customers on operational performance to operational performance which in turn affects business performance.

## 2. Literature Review

Integration in the supply chain shows a complex process of cooperation between companies and suppliers and buyers which if managed will increase efficiency in company operations and further increase company profits and provide satisfaction for all parties (Setiawan & Rahardian, 2005; Zhang & Dhaliwal, 2009). The standardization that occurs in integration makes integration must be characterized as cooperation, collaboration, information sharing, trust, partnership, shared technology, compatibility, sharing risks and benefits, commitment and shared vision. the same, dependence and sharing of the main processes (Hamidin 2010; Irmawati, 2007). The goal is to build a supply chain that focuses on maximizing value for customers. The key to effective supply chain management is to make suppliers as “partners” in the company's strategy to meet the ever-changing market (Barata, 2016). Thus, it is necessary to increase productivity in the business of managing product supply chains by involving suppliers in the company decision-making process. According to Mayasari (2008) businesses need appropriate strategies to survive in the market, to face competition, threats, and market opportunities. In addition to productivity and efficiency that need to be improved, outlets must also understand and know what consumers need. Pujawan and Mahendrawati (2010) explain that the importance of the role of all parties from suppliers, manufacturers, distributors, retailers, and customers in creating cheap, quality, and fast products is what gave birth to a new concept, namely supply chain management. Based on the description of the literature review and previous research, the hypotheses are described as follows:

- H<sub>1</sub>.** *Supplier integration had a positive influence on operational performance.*
- H<sub>2</sub>.** *Supplier integration positively influences business performance.*
- H<sub>3</sub>.** *Supplier integration affects business performance through operational performance.*

Trust between organizations is an important mediator that can increase and strengthen the influence of operational performance on company performance (Nie et al., 2011). With the mediation of supply chain integration systems that can evolve and change depending on the market and competitive response, this allows companies to achieve superior operational performance. Supply chain management as a term for the management of the supply chain and buyers, which includes all stages of processing from the purchase of raw materials to the distribution of finished goods to final consumers (Mughal, 2019). Supply chain management is the integration of the activities of procuring materials and services, converting them into semi-finished goods and final products, and delivering them to customers (Heizer & Render, 2008). Supply chain management is aimed as an approach applied to unite suppliers, entrepreneurs, warehouses, and other storage places (distributors, retailers, and retailers) efficiently, so that products can be produced and distributed in the right quantities, the right location, and the right time to lower costs and meet customer needs. Based on the description of the literature review and previous research, the following hypotheses were developed in this study:

- H<sub>4</sub>.** *Internal integration influences operational performance.*
- H<sub>5</sub>.** *Internal integration had a positive effect on business performance.*
- H<sub>6</sub>.** *Internal integration affects business performance through operational performance.*

Supply chain Management is an activity of processing raw materials into goods in process or semi-finished goods and finished goods then sending these products to consumers through the distribution system. This activity includes a purchasing function that relates between suppliers and distributors (Huda et al., 2018). Supply chain management is the strategic planning of the roles of each organization involved in supply chain activities with the aim of integrating supply and demand chain management. Creating an effective supply chain management system will benefit the company among these benefits namely, more efficient inventory and costs, increased productivity, faster processing and delivery, greater profits, and increased customer loyalty. Anggini (2018) defines supply chain management as the focus of science that integrates and manages the movement of goods and services and information in the supply chain so that it is responsive to customer needs while reducing total costs. When a company trusts its customer and treats them fairly, the company will view the relationship more as a strategic asset and a strategic tool that will strengthen the company's competitive ability (Nupus & Ichwanudin, 2021). The existence of cooperation with customers is expected to produce a good understanding and understanding of the needs and needs of each party (Cempakasari & Yoestini, 2003). An integration must be achievable for organizations or companies that are in the supply chain management network and the entire supply chain by integrating customer relationship management.

In addition, effective collaboration among various functional departments such as R&D, purchasing, manufacturing, and marketing, can help companies adapt quickly to set strategies and facilitate consumers in operational performance, such as delivery, cost, quality and flexibility (Droge et al., 2004; Wong et al., 2011). Based on the description of the literature review and previous research, the framework developed in this study is described as follows:

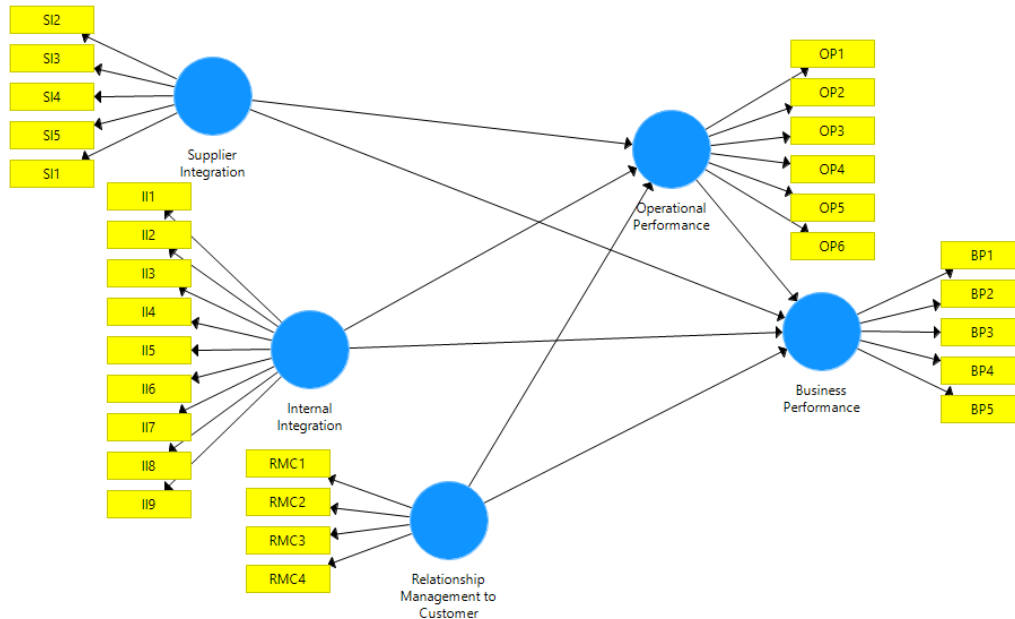
**H7.** Relationship management to customer has a positive influence on operational performance.

**H8.** Relationship management to customer positively influences business performance.

**H9.** Relationship management to customer has a strengthened effect on business performance through the role of mediating effect of operational performance.

Performance is a description of the level of achievement of the implementation of an organization's tasks in an effort to realize the goals, objectives, mission & vision of the organization. Organizational operational performance is conceptualized along the dimensions of cost, quality, flexibility and delivery. According to Daft (2010), operational performance is a field of management that specializes in the production of goods and services and uses special tools and techniques to solve production problems. Furthermore, Rani et al. (2017) states that the results of work functions or activities that exist in the company are influenced by internal and external factors of the organization in achieving the goals that have been set for a certain period of time. Measurement of company performance is the company's ability to create standards desired by customers by considering low production and maintenance costs, improving product quality, reducing work-in-process inventory, decreasing material handling costs and delivery deadlines (Tracey & Vonderembse, 2000). Based on the description of the literature review and previous research, the framework developed in this study is described in a chart as follows:

**H10.** Operational performance has a positive influence on business performance.



**Fig. 1.** Theoretical Model

### 3. Method

The data taken were 210 respondents involved in various industries in Central Java, Indonesia and then analyzed and processed using IBM SPSS Statistic software version 24 and Smart PLS 3.0 (Smart Partial Least Square). The sampling technique in this study used purposive sampling. Data obtained directly from respondents who meet the characteristics of the population determined by distributing questionnaires.

In this study, the independent variables are supplier integration (SI), internal integration (II), and relationship management to customer (RMC). In this study, the role of the intervening variable is operational performance (OP). In this study, the dependent variable is business performance (BP). The population used in this study is managers involved in various industries in Central Java, Indonesia. As described previously, the data collection method in this study was carried out by distributing questionnaires. Respondents were taken using a purposive sampling technique (Bougie & Sekaran, 2019). The respondents of this research are small and medium scale managers who carry out production and retail activities. The data analysis method used is the Partial Least Square (PLS) analysis method with the Smart Partial Least Square 3.2.7 program.

## 4. Results

In this study, the process of distributing questionnaires was addressed to 210 respondents, namely medium and large scale industries. All items in this questionnaire were measured using a 7-point Likert scale (1=strongly disagree; 7=strongly agree). The tests carried out in the analysis of variance-based SEM have two stages, namely the outer model and the inner model test. The explanation of the test is as follows.

### 4.1 Outer Model

Table 1 shows that the validity value of each indicator is above 0.7, so all research indicators are declared valid. In the outer model test, in addition to the convergent validity test, there is also a reliability validity test, namely a test that aims to determine the reliability of indicators in measuring variables, while a variable is said to be valid if it has an AVE value above 0.5 and the Cronbach Alpha value above 0.7, Table 1 showed the discriminant validity test in this study (Purwanto et al., 2021):

**Table 1**  
Validity and Reliability Test Results

Variable	Indicator	Loading	Cronbach's Alpha	CR	AVE
Supplier Integration	SI2	0.861	0.960	0.969	0.864
	SI3	0.944			
	SI4	0.988			
	SI5	0.967			
	SI1	0.882			
Internal Integration	II1	0.740	0.943	0.947	0.669
	II2	0.752			
	II3	0.728			
	II4	0.706			
	II5	0.761			
	II6	0.812			
	II7	0.938			
	II8	0.940			
	II9	0.940			
Relationship Management to Customer	RMC1	0.912	0.904	0.932	0.774
	RMC2	0.859			
	RMC3	0.906			
	RMC4	0.841			
Operational Performance	OP1	0.916	0.939	0.952	0.768
	OP2	0.912			
	OP3	0.861			
	OP4	0.837			
	OP5	0.917			
	OP6	0.810			
Business Performance	BP1	0.982	0.950	0.962	0.836
	BP2	0.840			
	BP3	0.918			
	BP4	0.899			
	BP5	0.926			

Moreover, Table 1 shows that all Cronbach alpha values and the average variance extracted exceed the minimum limit so that all variables are declared valid.

**Table 2**  
R<sup>2</sup>, and Q<sup>2</sup> Test Result

Indigenous variables	R <sup>2</sup>	Q <sup>2</sup>
Operational Performance	0.705	0.527
Business Performance	0.613	0.511

**Table 3**  
Fit Model

	Saturated Model	Estimated Model
SRMR	0.169	0.169
d_ ULS	12.481	12.481
d_ G	7.335	7.335
Chi-Square	5252.046	5252.046
NFI	0.544	0.544

From Table 2, the R square value is high. It can be seen that 70.5% of operational performance is influenced by supplier integration (SI), internal integration (II), and relationship management to customer (RMC), while the remaining 29.5% is influenced by other variables outside the study. The business performance variable is influenced by supplier integration (SI), internal integration (II), and relationship management to customer (RMC) and operational performance is 61.3% while the remaining 34.1% is influenced by other factors outside the theme of this study. The results also showed that the data is fit, indicated by the values of all indicators used in this study. The analysis showed that the values of SRMR, d\_ ULS, d\_ G, Chi-Square and NFI are acceptable both for saturated and estimated models (Table 3).

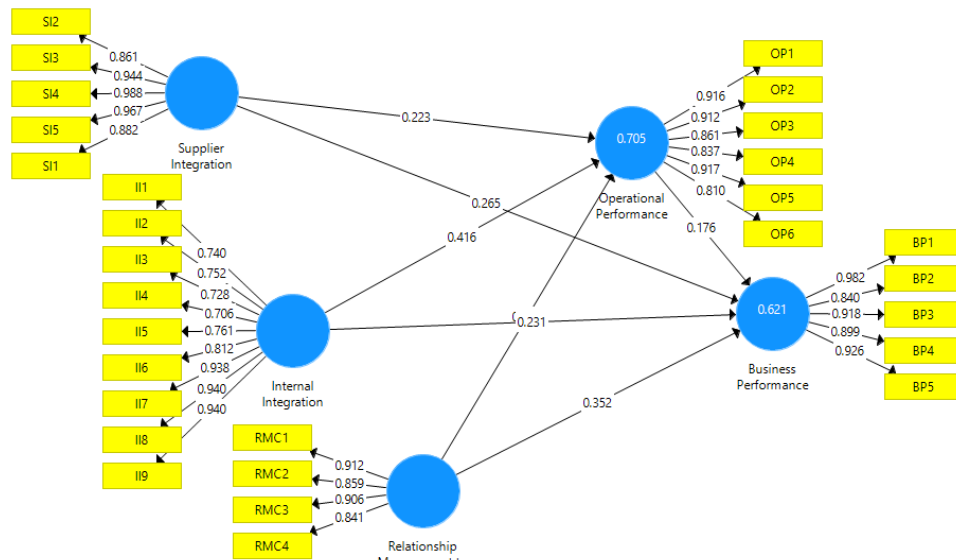
4.2 Inner Model

Furthermore, in addition to the inner model tests as described previously, there is also a hypothesis test, while the hypothesis testing in this study is as follows. Hypothesis testing in this research is done by bootstrapping the research model. Furthermore, it can be seen the value of T-statistics or P-value of each latent variable. This study uses (alpha) of 5%. This analysis was conducted with the intention of knowing how big the level of significance of the influence of exogenous variables on endogenous variables. Table 4 is the result of calculating the path coefficients of this research model.

**Table 4**  
Direct, Indirect, and Total Effect Test Result

Hypotheses	Direct		Indirect		Total	
	TValue	PValue	TValue	PValue	TValue	PValue
Supplier Integration → Operational Performance	5.516	0.000	-	-	5.516	0.000
Supplier Integration → Business Performance	4.996	0.000	2.192	0.029	5.554	0.000
Internal Integration → Operational Performance	7.330	0.000	-	-	7.330	0.000
Internal Integration → Business Performance	3.816	0.000	2.146	0.032	6.383	0.000
Relationship Management to Customer → Operational Performance	7.354	0.000	-	-	7.354	0.000
Relationship Management to Customer → Business Performance	4.893	0.000	2.074	0.039	7.907	0.000
Operational Performance → Business Performance	2.258	0.024	-	-	2.258	0.024

A formative construct will be declared significant if it has a P-value smaller than the 5% significance value (P-value < 0.05) and has a T-statistic value > 1.96. If you look at the data in Table 2, it can be seen that the influence of supplier integration (SI) relationships on operational performance (OP); supplier integration (SI) to business performance (BP); internal integration (II) on operational performance (OP); internal integration (II) on business performance (BP); relationship management to customer (RMC) on operational performance (OP); relationship management to customer (RMC) on business performance (BP); and operational performance (OP) on business performance (BP) has a PV value < 0.05 and a T-statistic value > 1.96, so it is accepted (significant). In this study, the intervening variable test was carried out by bootstrapping the research model by looking at the value of T-Statistics and P-value on the specific indirect effects test, so that it can be seen how influential/significant the competitive advantage variable is as an intervening variable between the independent variables (supplier integration, internal integration, and relationship management to customer) on the dependent variable (business performance) as an indirect relationship (Fig. 2).



**Fig. 2.** Full Model

5. Discussion

The results of this study found that Supply Integration (SI) had a positive and significant effect on operational performance and company performance. This shows that Supply Chain Integration (SI) in the companies can collaborate with their supply chains and collaborate in managing intra- and inter-organizational processes to achieve an effective and efficient flow of products and services, information, costs, and decisions with the aim of providing maximum value. to customers at low cost

and high speed. These findings are also in line with (Zhao et al., 2008; Droge et al., 2004; Wong et al., 2011) who found that effective collaboration among various functional departments such as R&D, purchasing, manufacturing, and marketing, can help companies adapt quickly to set strategies and facilitate consumers in operational performance, such as delivery, cost, quality and flexibility. Furthermore, this also continues to increase the company's performance (Table 5).

**Table 5**

Summary of hypothesis testing

Hypothesis	Estimate	Significance	Confirmation
Supplier Integration → Operational Performance	+	<0.05	accepted
Supplier Integration → Business Performance	+	<0.05	accepted
Internal Integration → Operational Performance	+	<0.05	accepted
Internal Integration → Business Performance	+	<0.05	accepted
Relationship Management to Customer → Operational Performance	+	<0.05	accepted
Relationship Management to Customer → Business Performance	+	<0.05	accepted
Operational Performance → Business Performance	+	<0.05	accepted
Supplier Integration → Operational Performance → Business Performance	+	<0.05	accepted
Internal Integration → Operational Performance → Business Performance	+	<0.05	accepted
Relationship Management to Customer → Operational Performance → Business Performance	+	<0.05	accepted

The results of this study found that the Integration Process has a positive and significant effect on operational performance and company performance. The purpose of supply chain management is to integrate the company's main business processes starting from upstream and downstream relationships and even to end users, through the provision of products, services and information that provide added value to consumers and other stakeholders (Setiawan & Rahardian, 2005). Integration is the joining of parts or activities to form a whole, integration can improve relationships in each value chain, facilitate decision making, enable value creation and transfer processes from suppliers to end customers to operate the flow of information, knowledge, equipment, and physical assets (Hamidin, 2010). Integration in the supply chain shows a complex process of cooperation between companies and suppliers and buyers which, if managed, will be able to increase efficiency in the company's operations and further increase company profits and provide satisfaction for all parties (Setiawan & Rahardian, 2005). Based on the results of the analysis above, it shows that there is a significant influence of the supply chain management variable on operational performance and company performance. The results of the analysis also find that Supply Chain Management has an indirect effect on the Company's performance through operational performance. The results of this study are in accordance with the results of research conducted by Li et al. (2006) and Suharto (2013) which proves that there is a significant relationship between Supply Chain Management on operational performance, Supply Chain Management on company performance, and performance. operations on the Company's Performance.

## 6. Conclusion

Based on data analysis, it can be concluded that operational performance is able to mediate the influence of supplier integration, internal integration, and relationship management to customers on business performance. To improve the company's performance, it is necessary to have a strategy to improve operational performance that is implemented through supplier integration, internal integration, and relationship management to customers. Companies must maintain supplier integration, as the basis for implementing supply chain management and internal integration as a combination of all existing activities along the company's supply chain management. If all of this is applied to the company, it can improve company performance.

In a theoretical scope, the findings resulting from this study highlight the important role of operational capabilities in supply chain management by mid-level managers. Their role is needed to operationalize the business strategy at the lower level through a series of coordination and consolidation between the organization's external and internal resources. Practically, these findings encourage managers to be actively involved in emphasizing organizational performance by involving aspects of consolidation between elements of organizational resources. The three related elements that can be bridged by operational aspects include suppliers, internal units and consumers.

The limitation of this research is the limited number of respondents from international companies who are willing to be involved in this research. This creates a perspective regarding entry into international markets. Because the role of the global supply chain is very decisive for large and medium-sized companies, this study is generally limited in generalizability in companies that focus on domestic demand and markets. Future studies can emphasize the mediating role of operational capabilities for companies that depend on supply chains and international markets. In addition, it is recommended to explore other variables that are specifically related to resource consolidation and entry into international markets.

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