

Exploring the role of supplier integration, customer integration on operational performance by mediating the SMEs supply chain flexibility

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Exploring the role of supplier integration, customer integration on operational performance by mediating the SMEs supply chain flexibility

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ABSTRACT

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This research investigated the relationship between supplier integration and customer integration on operational performance by mediating supply chain flexibility in SMEs in Indonesia. The method used in this research used quantitative methods using a conceptual framework. Structural analysis of research data was performed using structural equation models (SEM) with SmartPLS 3.0 software. A total of 21 respondents to this study were 650 SMEs owners in Indonesia who were determined using the simple random sampling method. Data collection in this study was carried out on primary data in the form of respondents' statements obtained from answers to online research questionnaires designed using a Likert scale of 7. The results of this study stated that Supplier Integration had a positive and significant effect on supply chain flexibility. Customer Integration had a positive and significant effect on Supply Chain Flexibility. Supply Chain Flexibility had a positive and significant effect on operational performance. Supplier integration had a positive and significant effect on operational performance. Customer integration had a positive and significant effect on operational performance.

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1. Introduction

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In the current era of globalization, Small and Medium Enterprises (SMEs) are required to improve their supply chain performance. To increase their capacity and performance, SMEs need to identify their supply chain. By identifying the supply chain, SMEs can improve efficiency and develop their own supply chain. One of the weaknesses of SMEs in developing is that the supply chain that is used is not clearly identified. This is because supply chain implementation is still oriented towards large-scale companies. For this reason, this community service aims to provide an understanding of the implementation of supply chain management to SMEs members. In this era of the industrial revolution, competition in the industrial sector, both goods and services, is getting tougher (Rahadjeng et al., 2022). As a result of globalization and the free-market economy implemented by several world trade organizations, things that hinder free market competition, such as import duties and government protection and subsidies must be abolished. If a company only relies on optimizing its internal structure and infrastructure based on business strategy, it is not enough to win the competition. The company must have a new strategy that covers the entire scope of its business, namely the scope of internal and external processes, namely suppliers and consumers. A successful company is a company that is able to carefully link its internal and external business scopes in a chain called the supply chain. Therefore, at this time it is not a competition between companies (Yusuf & Soediantono, 2022). A company

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engaged in manufacturing always wants success in future activities. This shows that every company always strives to continue to develop in its line of business in the future. The development of information technology is needed to carry out marketing where in the modern era like today marketing with online methods is needed, so that online-based marketing is one of the factors in achieving operational performance (Devaraj et al., 2007; Shou et al., 2018). With increasing business growth and market interest, it has implications for increasing customer demand for the desired product so that goods distribution activities are required to meet market demand more quickly and precisely (Haudi et al., 2022; Lau et al., 2010).

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The supply chain concept is a new concept in looking at logistics issues (Abdallah et al., 2014). The old concept saw logistics more as an internal company problem whose solution was focused on each company. Subsequent developments, logistics issues are seen more broadly which is the supply chain of goods from suppliers, companies to consumers which is called supply chain management. The purpose of supply chain management itself is to integrate suppliers, companies, warehouses to retailers so that goods can reach consumers in the right quantity, location, and time. The main obstacle in supply chain management is integration. The intended integration is not within the scope of one company only, but between the company itself and SMEs companies upstream and downstream. He et al. (2014) explained that this integration does not involve certain ownership or domination, but rather a merger of companies and activities through information. Supply chain integration requires process integration which means close cooperation between buyers and suppliers, joint product development, joint system development and information sharing. Effective integration in the supply chain will be a key factor for SMEs in achieving the improvements needed to remain competitive. The main goal of integration between a company and its suppliers and consumers is to create and coordinate supply chain processes in a way that is difficult for competitors to imitate (Rizki et al., 2022). Every SMEs tries to increase productivity, efficiency, easy and fast service and continues to develop the products so that they remain superior and survive in the market. SMEs need to consider supply chain issues which serve as a check that supply chain management supports the SMEs strategy. If the operations management function is to support the overall SMEs strategy, then supply chain management can be used to support the operations management strategy (Haris & Kusuma, 2023).

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Cheng et al. (2016) explained that the main determinant of the supply chain is no longer the company but the consumer. Consumers are free to make their own choices of the various choices of goods or services available on the market so that SMEs try to adjust their products according to the choices and wishes of their consumers. Therefore, in this supply chain integration, the level of consumer participation is as important as the collaboration between companies and suppliers. For example, the efforts of SMEs to attract loyal customers by creating product packages that are tailored to the interests of their consumers. So far, the implementation of supply chain integration has been influenced by the level or class of the SMEs concerned, for example, international-class companies tend to have more extensive and balanced integration with their consumers and suppliers compared to domestic-class companies and improve the performance of a company. For this reason, SMEs try to establish harmony in supplier-company-consumer relationships. This effort is made to improve the performance of SMEs companies which is manifested by increased productivity and the ability of SMEs companies to differentiate themselves from their competitors (Soemadi et al., 2022).

2. Literature Review and development hypothesis

2.1 Supply Chain Management

According to Chavez et al. (2015), supply chain management is a logistics facility that forms the purchasing function, material transformation and distribution process of these products to consumers. The scopes of activities classified in supply chain management are customers, planning, purchasing, inventory, production, and transportation. Supply chain and supply chain management have become a jargon that is often found in various media, both management magazines, bulletins, newspapers, books and discussions. Some even have the perception that the supply chain is only owned by manufacturing companies. As a discipline, supply chain management is a relatively new discipline. The term "supply chain management" only appeared in the early 90s and this term was introduced by management consultants. Currently, supply chain management is a hot topic, interesting to discuss, and even invites extraordinary interest from both academics and practitioners (Purwanto et al., 2022). The supply chain can be defined as a set of activities involved in the process of transforming and distributing goods from the earliest raw materials from nature to finished products to the final consumers.

2.2 Supply Chain Integration

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According to Arijanto (2022), chain integration will not be separated from supply terms since supply chain integration is based on the reference of the extent to which an organization is very strategic to be able to work together in supply chain management partners and also manage an organization's processes, whether domestic or international, in order to achieve a product average, information services, payments, as well as taking decisions efficiently and with the goal of providing a very maximum added value for service users. There are three main elements that can be explained for an integration of the existing supply chain in the model, with clear and transparent information systems (regarding information management and financial flows), inventory management (product flows and material flows), as well as supply chain correlation (management of relationships between trading partners). Supply chain integration refers to the extent to which strategic organizations cooperate with supply chain partners and manage intra- and inter-organizational processes to achieve an effective and efficient

20 flow of products, services, information, money, and decisions with the aim of providing maximum value to customers (Zhao et al., 2018). Integrating supply chain management is an important business process for transferring products, services and information from suppliers to final consumers and for increasing the added value of products, services and information.

3
H1: *Supplier Integration has a positive and significant effect on supply chain flexibility.*
H2: *Supplier Integration has a positive and significant effect on Operational Performance.*

2.3 Customer Integration

1 Customer integration in a place refers to one place which is a big challenge for a company to the extent that a company can partner with members and store customer data, potential or business level will experience failure due to different and irregular customer data storage (Afshari & Motwani, 2018). Customer integration is through the integration of the boundaries of logistics activities outside a company (Kumar et al., 2017). To achieve the company's supply chain bears everything that will be obtained by the customer, the supply chain is the key to all integration processes in developing a market or inter-organizational strategy, procedures, practices and processes of collaboration into the organization, as well as synchronization of management to be able to meet a need from a customer. Because customers are the most important data for the company, the strategy adopted to face market challenges is with a new strategy (Boer & Boer, 2018; Yuen & Thai, 2017).

3
H3: *Customer Integration has a positive and significant effect on Supply Chain Flexibility.*
H4: *Customer Integration has a positive and significant effect on Operational Performance.*

2.4 Supply Chain Flexibility

4 Firm flexibility is the firm's ability to adapt internally to external changes. Supply chain flexibility can be defined as the company's ability to adapt supply chain practices following the changing environment to improve performance (Bag & Rahman, 2023). The flexibility of the company is determined by the supplier's ability to anticipate sudden changes to support manufacturing to meet customer demands. Flexible companies cannot be determined independently, but requires cooperation with partner companies. The flexibility provided by a manufacturing company depends on and relates to vendor flexibility in complying with delivery times, order sizes, and flexibility. Manufacturing flexibility is the company's ability to make changes related to production levels, often creating new products, to increase the company's competitiveness. The flexibility of the company also refers to meeting customer needs.

3
H5: *Supply Chain Flexibility has a positive and significant effect on Operational Performance.*

2.5 Operational Performance

Operational performance is a standard for measuring the success of a company in managing its operations. The company's success is measured by achieving competitive advantage through the acquisition of value advantage and productivity advantage. According to Lotfi et al. (2013); Munir et al. (2020); Saragih et al. (2020) the sources of competitive advantage are: The ability of a company to serve consumers that can differentiate itself from its competitors which is called value benefit. A very important factor in obtaining value benefits is providing the best possible service. Indicators of value benefits according to Frohlich da Westbrook (2016) are customer service, customer satisfaction, conformance quality, product variety and timely delivery. Chen and Pauraj (2016) consider performance to be the main measure of a company's performance, because the main goal of an organization is to make profits for shareholders. Company performance relates to external supply chain partners, internal company functions, processes, and all external and internal connections.

3. Method

The design in writing this survey is descriptive in nature by providing a detailed description or explanation of a symptom or phenomenon. A case in research is also in a certain place well.

5 This research method is a quantitative survey, analysis of research data has been accomplished using structural equation modeling (SEM) with the SmartPLS 3.0 tool. **21** respondents to this study were 650 UKM owners in Indonesia who were determined using the simple random sampling method. Data collection in this study was carried out on primary data in the form of respondent statements obtained from answers to online research questionnaires designed using a Likert scale of 7.

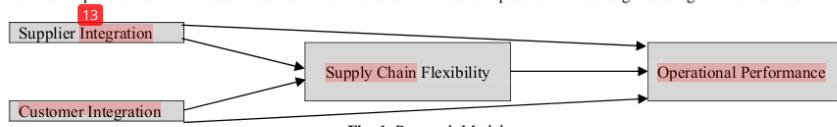


Fig. 1. Research Model

4. Results and discussion

4.1 Validity and reliability testing

The validity test was carried out by using a factor analysis test for each statement indicator contained in the questionnaire. Statement indicators can be said to be significant if they have a loading factor value of ≥ 0.7 and the loading factor value is not part or member of other indicators. This indicates that the indicators in the instrument are a unit of measuring instrument that provides a measure of the same construct and at the same time can provide predictions of what should be predicted.

2
Table 1
Reliability Test

Reliability Testing	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Supplier integration	0.812	0.827	0.743	0.623
Customer integration	0.816	0.818	0.843	0.613
Operational performance	0.835	0.934	0.814	0.614
Supply chain flexibility	0.824	0.824	0.814	0.613

Table 1 shows the results of the reliability test with the Cronbach's alpha value for each variable, which can be said to be valid or reliable. A variable can be said to be valid or reliable if the Cronbach's alpha value is ≥ 0.6 . It can be concluded that the answers given by each respondent to the statements in the chain transformational leadership variable consistent supply chain innovation performance and satisfaction with supply chain results helps each indicator to measure the concept it measures.

4.2 Coefficient of Determination

2 Based on the data presented in Table 2, the R-Square value for supply chain flexibility variable is 0.583. The obtained value 2 explains that the percentage of supply chain flexibility can be explained by supplier integration 2 and customer integration is 58.3 % and the remaining 41.7 % is explained by other factors not discussed in this study. The R Square value for Supply Chain Performance variable is 0.755. The obtained value explains that the percentage of Supply Chain Performance can be explained by supplier integration, supply chain flexibility and customer integration is 75.5 % and the remaining 24.5 % is explained by other factors not discussed in this study.

Table 2
R Square

R Square	R Square	R Square Adjusted
Supply chain flexibility	0.583	0.581
Supply Chain Performance	0.755	0.741

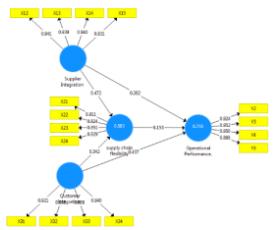


Fig. 2. Validity and reliability testing

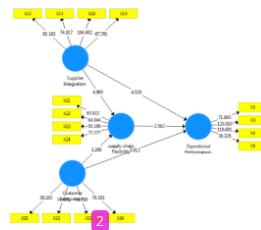


Fig. 3. Hypothesis Testing

5. Hypothesis Testing

Hypothesis testing in this study was carried out by looking at the T-Statistics value and the P-Values value. The research hypothesis can be declared accepted if the P-Values <0.05 .

Table 3
Direct Hypothesis testing

Hypothesis	T Statistics	P Values	Result
Supplier Integration on supply chain flexibility.	4.985	0.000	Supported
Supplier Integration on Operational Performance.	5.520	0.000	Supported
17omer Integration on Supply Chain Flexibility.	3.296	0.000	Supported
Customer Integration on Operational Performance.	5.812	0.000	Supported
Supply Chain Flexibility on Operational Performance.	2.562	0.000	Supported

Table 4 2
The indirect hypothesis Testing

Hypothesis	T Statistics	P Values	Result
Supplier Integration - supply chain flexibility → Operational Performance.	4.231	0.000	Supported
Customer Integration - supply chain flexibility → Operational Performance.	5.238	0.000	Supported

5.1 Discussion of Research Results

The Effect of Supplier Integration on Supply Chain Flexibility

Based on the accumulated results of the questionaire answers that have been collected from the respondents, then analyzed using the SmartPLS 3.0. and the results show that H0 is rejected and H1 is accepted since the t-table value is 4.985 and is meaningful when the level of significance is one percent. Based on the results of testing the first hypothesis, it is known that Supplier Integration has a significant positive effect on Supply Chain Flexibility. Positive influence means that the better the Supplier Integration in carrying out the work, the better the Supply Chain Flexibility adopted by employees. The findings of this study prove that Supply Chain Flexibility is influenced by Supplier Integration in a company (Fianko et al., 2023).

The Effect of Customer Integration on Supply Chain Flexibility

Based on the results analyzed, it is proven that the t-count value is > t-table value or 3.296 and the t-table value is 1.99 shows a value of 0.001 > 0.05. The results of the hypothesis test show that H0 was rejected and H1 was accepted and customer integration has a positive effect on chain flexibility.

The Effect of Supply Chain Flexibility on Operational Performance

Based on the research conducted, there is a significant relationship between the overall flexibility variable and the effect of adaptability, supply chain flexibility on operational performance. Thus, the authors conclude that with the supporting variables, Operational Performance can run well, with good management or development of human resources (human resources), and there is a better Operational Performance. To cover all the factors that affect Operational Performance, the authors use the questionnaire by Kim (2013) and Saragih et al. (2020) to measure Performance Operational which includes elements of adaptability/work performance and Supply Chain Flexibility. Supply Chain Flexibility is quite an interesting and important issue, since it has proven to be of great benefit to the interests of individuals, government and society.

The Effect of Supplier Integration on Operational Performance

Based on the hypothesis test, Supplier Integration influences Operational Performance since the probability t count is smaller than the significant value of 0.05. Operational Performance is one of the factors that can support Operational Performance, since Operational Performance is a person's internal state that activates and directs his behavior towards certain targets. The existence of Supplier Integration that exists within employees which has an impact on Operational Performance. Ruzo-Sannmartin et al. (2023) define Operational Performance as a stimulus or driving force, which stimulates, encourages employees to work as hard as they can. While operational performance achievement is an encouragement to pursue and achieve goals which are the targets set. Someone with this drive hopes to achieve goals and exceed or develop success. Achievement is seen as important for a person's self, not just based on the award he receives. Operational performance is a standard for measuring the success of a company in managing its operations. According to Zhao et al. (2013) and Zaid et al. (2021), the company's success is measured by achieving competitive advantage through the acquisition of customer integration. For a company, the achievement of supplier integration can be influenced by several factors. One factor is Operational Performance. Operational performance is in the form of encouragement to pursue and achieve goals which are the targets set, where someone with this encouragement hopes to achieve goals and exceed or develop success. So, based on the results of the study, it shows that to improve supply integration, we need to increase operational performance (Shi et al., 2023).

The Influence of Customer Integration on Operational Performance

One of the factors that also determines the achievement of company goals is company integration. Customer Integration is very closely related to Operational Performance if Customer Integration goes well and correctly then Operational Performance will occur. In general, it can be said that good and correct Customer Integration in a company indicates that there is Operational Performance.

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Supply Chain Management is an integrated process of the overall movement of products or services from suppliers to customers which includes information, funds and other interrelated resources. Supply chain management has the goal of maximizing coordination between organizations involved in the supply chain to achieve competitive advantage. There are five main actors in supply chain management, namely suppliers, distributors, manufacturers, retailers, and customers. Suppliers are sources that provide the first materials, both raw materials, auxiliary materials or raw materials.

Based on the analysis, the results show that supply chain flexibility mediates positively and significantly in the relationship between supplier integration and operational performance, supply chain flexibility mediates positively and significantly in the relationship between customer integration and operational performance.

6. Research implications

The theoretical implication of this research is to support previous theories and research that customer integration has a positive and significant effect on supply chain flexibility. Supply chain flexibility has a positive and significant effect on operational performance. Supplier integration has a positive and significant effect on operational performance. Customer integration has a positive and significant effect on operational performance. The practical implication of this research is that to improve operational performance, owners or managers of SMEs need to empower the increase in customer integration variables, supply chain flexibility, supplier integration and customer integration.

7. Conclusion

The results of this study have confirmed that Supplier Integration has a positive and significant effect on supply chain flexibility. Customer Integration has a positive and significant effect on Supply chain flexibility. Supply chain flexibility has a positive and significant effect on operational performance. Supplier Integration has a positive and significant effect on operational performance. Customer integration has a positive and significant effect on operational performance. The company has implemented various ways to implement supply chain integration, although it is not perfect. Some of the things that companies put more pressure on in integrating suppliers-consumers are the coordination of delivery frequency information, the use of logistics equipment that supports both coordination and agents on appointing third parties as agents or distributors. Supply chain flexibility mediates positively and significantly in the relationship between supplier integration and operational performance, supply chain flexibility mediates positively and significantly in the relationship between customer integration and operational performance. The pattern of integration affects the company's performance. The more companies carry out integration with suppliers and consumers, the better the performance, whether the company gains trust or commitment from suppliers or consumer loyalty. In facing tighter competition, SMEs must work to improve coordination with suppliers and communicate more intensively with consumers. This study has several weaknesses, namely the limited sample so that non-parametric analysis tools must be used. Future studies should add more samples so that they can be processed using parametric analysis. Research assumptions such as normal distribution should be a concern for further research. Further research topics in this field are still open. The research object can be expanded not only to food service companies but also to other service companies such as retail, telecommunications and transportation. The research topic can also be expanded by making comparisons to what extent the pattern of integration between manufacturing companies and service companies and how it impacts the company's performance.

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