The analysis of dynamic supply chain capability and operational performance of food and beverage MSMEs in Sleman, Indonesia

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ABSTRACT

Dynamic capabilities in the supply chain play an essential role in improving an organization's operational performance. This research aims to see the influence of supply chain dynamic capabilities, including collaboration, integration, agility, and responsive capabilities, on the operational performance of food and beverage MSMEs in Sleman, Indonesia. The sample of this study is food and beverage MSMEs located in Sleman, Indonesia, which apply supply chain management capabilities such as collaboration, integration, agility, and responsive capabilities. The MSMEs must have been operated for more than three years, starting from 2019, so MSMEs already have a more robust supply chain network. Data from sixty food and beverage MSMEs was collected in 2024 using a set of questionnaires tested for validity using Pearson’s correlation and reliability using Cronbach’s Alpha. Data processing in this research uses SPSS 25 software with an analysis tool, namely multiple regression analysis. This analysis helps prove whether or not there is an influence between two or more independent variables on the dependent variable. The results of this research show that collaboration capabilities, integration capabilities, agility capabilities, and responsive capabilities partially have a significant positive effect on operational performance. Increasing collaboration capabilities between MSMEs and internal and external parties must be maintained to improve value from the MSMEs themselves. According to the hypothesis test results, the integration capability variable significantly influences the operational performance of MSMEs in Sleman, Indonesia. The agility capability variable significantly influences the operational performance of MSMEs in Sleman, Indonesia. The responsiveness significantly influences the operational performance of MSMEs in Sleman, Indonesia.

Introduction

The world is currently entering a period called the Fourth Industrial Revolution. Where this revolution is different from previous revolutions because this can be seen from the emergence of increasingly sophisticated technologies that can adopt the physical world, the digital world, and the biological world, which ultimately has an impact on all aspects of human life throughout the world (World Economic Forum, 2023), this fourth revolution will not only change the human treatment of objects but also change the treatment of other humans, change lifestyles, change ways of working, and change thought patterns, too. The changes and obstacles have caused humans to live in a time full of hope and face great dangers. Technological sophistication means everyone can connect to many other people just by using digital networks, which can dramatically streamline organizations.

The World Economic Forum (2023) stated that there is anxiety about this fourth industrial revolution, where rapid environmental shifts and uncertain environmental changes make organizations unable to adapt, the government could take wrong steps in empowering the environment and technology, inequality in society, and society's position is increasingly weakened. This revolution can also drive significant company changes regarding human resources, market technology, and product distribution. It is essential for an organization to survive in all conditions and must be able to improve organizational performance by relying on well-organized...
management. Good management can be reflected in the effective and efficient management of the organization, which will boost the organization's sustainable performance. Organizations can adopt a supply chain management strategy because this strategy is dynamic and can involve internal and external business units of the organization to meet customer needs, including employees and suppliers, manufacturers, retailers, warehousing, transportation, and even customers. Also, the implementation of supply chain management in companies aims to ensure that the entire series of processes, from the beginning of the customer making an order until the customer receives the order, have no problems and the customer feels satisfied (Chopra & Meindl, 2016).

Business operational performance is a series of activities carried out by business management to achieve business goals effectively and efficiently (Kareem & Kummitha, 2020). Operational performance can be concluded as one of the elements of success in a business's survival and development in a fiercely competitive environment. Operational performance in many industries has been recognized as a determining element of success for companies so that all business units within the organization strive to improve their operational performance and work together to realize their core business goals.

Danastry et al. (2018) defined operational performance as good performance in several parts of the organization, such as in the production section, marketing section, and management section of an organization, where each section can strengthen the company's position. Moreover, it provides a competitive advantage for the organization.

Improving operational performance is used to carry out business transformation in organizations. An organization's main goal to improve operational performance is to deliver more value to customers by using different methods from competitors; in this way, the organization can meet and satisfy customer needs. Customer needs can be realized by providing more value by creating products/services at cheap and affordable prices and creating a good and reliable supply chain climate for various users.

Tyagi (2014) explains that the supply chain is an organizational system that is used as a place to distribute products/services that have been produced to customers. The supply chain is a set of business processes that start with providing products/services from suppliers to organizations and then flowing them to customers. This chain will form a network of connected individuals, groups, and organizations that provide benefits to each other, work together, and have the same goal of procuring and distributing goods to the end user. According to Russell and Taylor (2019), supply chain management is a concept that can manage a series of information, products, and services across all organization networks that connect every user, be it customers, suppliers/partners, or internal to the organization.

Pujawan and Mahendrawati (2010) argue that many parties procure quality products/services and distribute goods quickly to end users, starting from suppliers, manufacturers, distributors, retailers, and customers, which can form a concept called supply chain management. Improvements in product/service presentation, productivity, service, and distribution involve various parties who must be empowered, and good relations must be maintained to create dynamism in the supply chain itself. Dynamic capabilities are the ability to develop the resources of each business unit in the company to give the company a competitive advantage in the business environment (Arranz et al., 2020).

Teece (2014) revealed that dynamic capabilities can be seen in organizations in terms of allocating internal and external organizational resources, business processes, and operations to gather knowledge about competitive advantage in conditions of fierce competition, which is often supported by environmental adaptation.

Dynamic capabilities enable companies to continuously innovate and modify organizational practices in response to environmental shifts, utilize sophisticated technology, and rely on agile technological change to support capabilities (Jiang, 2019). The practice of dynamic capabilities towards strategic decisions in supply chain management shows an urgency. Dynamic capabilities in the supply chain play an essential role in improving an organization's operational performance. They can guide the organization to empower its internal and external resources to create a solid and sturdy organizational climate in the face of fierce business competition and an unpredictable environment. The supply chain's dynamic capability is a unique capability that can enable managers to rearrange organizational resources, expand experience regarding market conditions, and be used as a learning medium regarding environmental changes (Teece, 2014). Mikalef et al. (2020) stated that with dynamic supply chain capabilities, all company barriers that have blurred in the supply chain and difficulties in achieving competitive advantage could improve.

Supply chain dynamic capabilities can be divided into several capabilities to help companies meet customer desires in a dynamic environment. Supply chain dynamic capabilities are divided into four different capacities, namely: collaboration capabilities, integration capabilities, agility capabilities, and responsive capabilities (Yu et al., 2019).

Collaboration capability involves all existing upstream and downstream parties, from raw material suppliers to the final user. Soosay and Hyland (2015) define supply chain collaboration capabilities as a shared responsibility for carrying out tasks and making joint decisions between supply chain partners. Cao and Zhang (2011) added that what needs to be done in supply chain collaboration is to form a partnership chain first, then share resources and information, give awards, and carry out responsibilities. Yunus (2018) said that several elements of collaboration must exist in a supply chain: collaboration from internal organizations, suppliers, and customers. The relationship between several elements of this collaboration must be appropriately maintained to carry out tasks well and enable organizations to combine operations more efficiently.
Integration capabilities enable organizations to establish strategic relationships and collaborate with their supply chain partners (Flynn et al., 2010). Angeles (2009) suggests that supply chain integration focuses on supplying the right products to customers at the right time and is supported by prices that customers can afford.

According to Dubey et al., 2018, “agility capability is the ability of the supply chain to take advantage of opportunities in the environment. This capability is essential for an organization to survive in all conditions and to be able to develop in a fierce environment. Supply chain agility is a dynamic process of adapting and rebuilding business processes to address environmental uncertainty.” Supply chain agility allows the creation of flexible supply chains (Gligor & Holcomb, 2012).

Responsive capability is an organization can respond to changes in the business environment (Williams et al., 2013). Responsiveness focuses on reducing service waiting time, improving service quality, providing feedback on customer orders and service risks, and optimizing distribution (Singh & Sharma, 2015). Holweg (2005) states that supply chain responsiveness is a company's ability to respond to changes in customer demand appropriately and quickly. Being responsive in all situations can be an adaptive response to environmental changes. Responsiveness in responding to customer needs, adapting to new markets, and reducing the risk of obstacles and supply chain disruptions are key elements stated by Shekarian et al. (2020) which are essential elements. Bowersox et al., 2002 emphasize that when there is high uncertainty in the environment, the need to be responsive also increases; this can be managed by practicing dynamic supply chain capabilities effectively.

MSMEs in Sleman consist of several sectors, one of which is the food and beverage sector, so food and beverage MSMEs also play a significant role in the high growth rate of MSMEs in Sleman. This food and drink business is quite promising to run, considering that food and drink are basic needs and are also basic needs of every human being for survival. Seeing this phenomenon, food MSMEs cannot be separated from customer demand and supply activities. This situation creates intense competition between business people in MSMEs operating in the food and beverage sector. The increasing number of food and beverage MSMEs in Sleman are competing to provide various food and beverage products to meet the wider community's needs.

The high level of competition between food and beverage MSME business actors makes the business environment increasingly dynamic, and consumer tastes increasingly diverse, so business actors must have many ways to adapt, respond quickly to changes, and remain persistent in managing the production process to create an excellent operational performance. As Fitriyani et al. (2022) proposed, companies will always look for the best strategies to create performance and gain profits if competition between businesses strengthens.

Our research has four objectives. The first objective is to analyze the effect of collaboration capability on operational performance. The second objective is to investigate the impact of integration capability on operational performance. The third objective is to analyze the effect of agility capability on operational performance. The fourth objective is to investigate the impact of responsiveness capability on operational performance. The researchers chose the population of the food and beverage MSMEs in Sleman, Indonesia, and used the multiple regression method to analyze the quantitative data.

This text has four chapters. The first chapter is about the literature on collaboration capability, integration capability, agility capability, responsiveness capability, and operational performance. The second chapter, the methodology section, explains the analysis. The next chapter is about the findings and discussion, and the final chapter consists of the research conclusion.

Literature Review

Theoretical Background

Supply Chain Dynamic Capabilities

Dynamic capabilities exist because of the emergence of updates that occur in the economic and business sphere. This dynamic capability also arises because of uncertainty in the market and organizational sphere. Dynamic capabilities were first proposed by Teece (2014). Teece said that dynamic capabilities are innovative strategic capabilities possessed by an organization to respond to and face a rapidly developing environment by adapting to the resources owned by the organization. According to them, the use of dynamic capabilities is also related to whether or not the organization can create, rebuild, unify, and configure the organization's internal and external resources in order to be able to survive in a fiercely competitive environment. Of course, this dynamic capability is very important for organizations to answer challenges and meet organizational needs now and in the future.

Dynamic capabilities in the supply chain are becoming increasingly important, considering a business's short-term and long-term sustainability. Ju et al. (2016) said that dynamic capabilities in the supply chain emerge due to shifts in supply and demand in the short and long term, apart from that due to the ever-changing market structure and customer requirements. With these things in place, the organization must have dynamic supply chain capabilities because, with this capability, the organization can create good relationships with other parties/external parties to the organization, both customers and suppliers who collaborate with the organization, which in turn can increase agility and high responsiveness to meet customer and supplier needs (Sanders, 2014).
Dynamic capabilities are high-level capabilities that can be broken down into several different capabilities. Organizations can use high-level capabilities as routines in organizational strategy. Kareem and Kummitha (2020) separate supply chain dynamic capabilities into several parts: collaboration, integration, agility, and responsiveness.

Collaboration capabilities

The practice of supply chain collaboration is increasingly increasing due to the influence of globalization and information technology. Given this influence, collaboration capabilities become a significant factor in creating adaptive supply chains that adapt to frequently changing environments (Narus & Anderson, 1996). “Supply chain collaboration is a combination of two chain members or even more chains working together to form a competitive advantage by sharing information, sharing benefits, and making joint decisions in order to obtain greater profits by providing satisfaction to customers rather than having to act alone (Simatupang & Sridharan, 2005)”. Supply chain collaboration allows individuals or organizations to collaborate to increase productivity and achieve high performance (Cao & Zhang, 2011).

Organizations that apply supply chain collaboration carry out various tasks and responsibilities, exchange information regarding planning and implementation and performance measurement to meet common goals, and create a coordinated supply chain. Good collaboration will benefit each party, so each party collaborating must take an approach to improve its supply chain performance.

“Panahifar et al. (2018) stated that supply chain collaboration is a practical approach to help organizations face existing challenges and survive in fierce competition”.

Collaboration capabilities can be measured with the following indicators:

i. Agreement with partners
ii. Actively collaborate in group decision-making with partners
iii. Actively collaborate in group problem-solving with partners
iv. Good relationship with partners
v. Development of strategic plans in collaboration with partners

Integration capabilities

Integration means all processes in the supply chain, which are a compact unit, influence each other and are interdependent (Said, 2006). Integration is the unity of several economic processes or previously successful industrial unions. Supply chain integration can be optimal if the organizations realize efficient continuity between various supply chain activities/processes, and such continuity must be subject to the construction and utilization of various supply chain practices for a more integrated and effective supply chain (Wu et al., 2006).

According to Helfat and Raubitscch (2018), integration capabilities are created through communication and coordination of supply chain activities. Supply chain integration capabilities provide a way for sharing information between actors in a supply chain so that good communication can be created and joint decision-making can be made. It can create a good climate within the scope of the supply chain.

Integration capabilities can be measured with the following indicators:

i. Standardize data with partners
ii. Integration of information systems with partners
iii. Estimate and plan activities collaboratively with partners

Agility capabilities

“Supply chain agility is the company's ability to respond to changes in the market environment, such as supply and demand, in terms of quality, quantity, variety, network, logistics, and supply patterns in various ways” (Blome et al., 2013). Apart from that, Shukor et al. (2020) stated that supply chain agility is part of a company's strategic capabilities, enabling the company to perceive and respond to uncertainty in the business environment, both internal and external, to turn to change into profit.

Supply chain agility capabilities can be realized through customer effectiveness and seen in the organization's downstream operations (Chan et al., 2017). “Supply chain agility is also a foundation for surviving and developing in an ever-changing environment, forming a flexible supply chain” (Gligor & Holcomb, 2012). “Agility capability is defined as the ability of internal collaboration and also the external collaboration of an organization with partners, namely suppliers, and customers, to adapt or respond quickly and responsively to market changes and potential and actual disruptions” (Braunscheidel & Suresh, 2019). By relying on the integration of their partnerships to meet customer needs, supply chain agility capabilities can be relied upon because it is the complexity of thought patterns, intelligence, and processes that occur within the organization that enables the organization to respond quickly to environmental uncertainty and change in a reactive, proactive and ultimately predictable manner (Fayazi et al., 2015). The characteristic of supply chain agility is speed in the form of responsiveness and flexibility (Blome et al., 2013).

Agility abilities can be measured with the following indicators:
i. Adapting services and/or products to new customer needs,
ii. React to new market developments.
iii. React to significant increases and decreases in demand.
iv. Adjust the product portfolio to meet market needs
v. Respond to changes in competitors' strategies.

**Responsive capability**

Responsive capability is “the ability possessed by an organization to respond to environmental changes and shifts” (William et al., 2013). In addition, “Singh and Sharma (2015) said that supply chain responsiveness is a high-level capability possessed by the company and its partners which enables the company to adapt to environmental changes and shifts in business environmental conditions by modifying several elements, such as capabilities, activities or processes, and human resource behavior”.

Responsive capability can be measured with the following indicators:

i. Respond to consumer needs quickly
ii. Feedback to suppliers is faster and more effective
iii. Response to competitors' quality strategies is faster and more effective
iv. Response to changes in supply scope
v. Response to supply chain

**Operational Performance**

A company formed and established indeed has goals that must be achieved, and to achieve those goals, an organization must perform well and remain sustainable. In general, company performance is the implementation of the company's strategies. Of course, performance is a critical aspect of the company's changes and developments over a specific time. Furthermore, operational performance is defined as the alignment of processes and evaluations that occur in operational practices within the scope of the organization or whether the organization carries out its operations based on regulations in terms of costs, service quality, logistics, product or service quality, and product or service flexibility (Brah & Lim, 2006).

Operational performance means an effort made by an organization to create measurable output where the output has actual results that are in line with the expectations of the organization itself. Performance is obtained by an individual or an organization with their respective responsibilities to improve the organization and, of course, must be carried out under the law and not in conflict with applicable norms. The output produced by a company within a specific time must refer to standards that have been set and are the embodiment of plans that have been prepared by relying on employees with skills, competence, and motivation.

Operational performance can be measured with the following indicators:

i. Fulfillment of market requirements
ii. Response to changes in market demand
iii. Serving food and drinks on time
iv. Reliable quality products
v. Reduction of waiting time to fulfill customer orders

**Hypothesis Development**

**Supply Chain Collaboration Capabilities and Operational Performance**

Collaboration capabilities act as a driving force in supply chain management across multiple functions and existing organizational chains. Partnerships in different supply chains are not allowed to compete independently, where all partners are part of an integrated system and become close and collaborate with other chain members. This certainly shows a complex relationship that contains many processes and activities, so a collaborative system is needed to support the running of a process to achieve supply chain goals (Arshinder et al., 2011).

Cao and Zhang (2011) argue that “supply chain collaboration significantly impacts achieving collaborative advantages that enable supply chain partners to increase synergy, achieve superior performance, and jointly respond to non-dynamic market needs.” Furthermore, Jimenez et al. (2019) stated that by establishing supply chain collaboration with external parties, companies can increase and encourage incremental and radical innovation, which is reinforced by the statement of Stank et al. (2001), who stated that “both internal and external partnerships are essential to ensure performance. Collaboration can improve profitability, reduce purchasing costs, and improve technical cooperation.”

A study by Kareem and Kummitha (2020) shows a positive and significant relationship between supply chain collaboration capabilities and operational performance. Additionally, Weingarten et al. (2010) research shows a positive and significant relationship between collaborative practices and company performance.

$H_1$: Supply chain collaboration capabilities positively affect operational performance.
Supply Chain Integration Capabilities and Operational Performance

Supply chain integration capabilities enable organizations to face challenges, overcome uncertainty, and manage risks in the supply chain environment by improving the collection and processing of information related to planning, operations, and logistics. Schoenherr and Swink (2012) say that integration capabilities play a role in collecting information from both internal and external sources in a timely and reliable manner. Integrated systems prevent and mitigate disruptions and can facilitate responding to unexpected changes. Chen et al. (2009) suggest that supply chain integration capabilities are built with organizational processes that have good potential to achieve a series of organizational performances. Furthermore, supply chain integration helps facilitate an organization's restructuring of processes and resources more effectively, which will impact the improvement of the organization's operational performance.

In previous findings, Oh et al. (2019) revealed that supply chain integration capabilities improve organizational performance by reducing the bullwhip effect in the supply chain and supporting companies to respond more quickly to market demand. Furthermore, Flynn et al. (2010) found that supply chain integration is significantly related to operational and business performance.

H2.: Supply chain integration capabilities positively affect operational performance.

Supply Chain Agility Capabilities and Operational Performance

Agility capability is an essential and severe element that needs to be considered for organizational resilience and long-term organizational sustainability. In a dynamic and changing environment, companies must increase their efforts for all disruptions and unpredictable conditions to maximize the agility and resilience of their supply chain systems (Tang & Tomlin, 2008). With agility capabilities, organizations can effectively and efficiently match all their internal and external resources.

Previous research by Blome et al. (2013) stated that supply chain agility capabilities are positioned as dynamic capabilities that organizations should have because they will positively impact the sustainability of the organization's operational performance. Furthermore, research by Oh et al. (2019) revealed that continuous improvement in supply chain agility capabilities, namely increasing responsiveness to change with minimal costs, will positively impact company performance and competitiveness.

H3.: Supply chain agility capabilities positively affect operational performance.

Supply Chain Responsive Capability and Operational Performance

Williams et al. (2013) stated that “supply chain response has become a significant capability of a company's supply chain system. Supply chain responsiveness is a company's ability to respond quickly to changes in consumer needs, production and delivery quantities, and product mix, volume, and delivery in response to shifts in demand and supply on operational performance.” These situations will improve performance outcomes such as lower production costs, greater customer satisfaction, and faster delivery (Yu et al., 2019). In addition, Prajogo and Olhager (2016) show that supply chain responsiveness positively impacts operational performance.

H4.: Supply chain responsiveness positively affects operational performance.

Research and Methodology

This research is quantitative research that uses study methods. This research uses a type of survey research, namely an information-gathering technique that compiles a list of questions/questionnaires asked to respondents. In this study, researchers want to know how the dynamic capabilities of the supply chain influence the operational performance of food and beverage MSMEs.

The population was all food and beverage MSMEs in Sleman, Indonesia. This study used a purposive sampling technique to select food and beverage MSMEs that apply supply chain management capabilities such as collaboration, integration, agility, and responsive capabilities and have been operating for more than three years, starting from 2019.

Quantitative analysis is an analysis used to process data that has been obtained from respondents. In this study, the systematic analysis used is multiple regression analysis. The multiple regression analysis method measures the influence between more than one variable predictor (independent variable) and the dependent variable (Sugiyono, 2018).
Validity testing for this research uses a Pearson’s product moment correlation with the help of SPSS software. If the Pearson Correlation and significance value (2-tailed) ≤ 0.05 with a confidence level of 95%, then the questionnaire item is valid.

<table>
<thead>
<tr>
<th>Item</th>
<th>Pearson Correlation</th>
<th>Significance</th>
<th>Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC1</td>
<td>0.737</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>CC2</td>
<td>0.638</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>CC3</td>
<td>0.709</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>CC4</td>
<td>0.671</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>CC5</td>
<td>0.644</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>IC1</td>
<td>0.818</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>IC2</td>
<td>0.785</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>IC3</td>
<td>0.798</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>AC1</td>
<td>0.721</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>AC2</td>
<td>0.633</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>AC3</td>
<td>0.687</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>AC4</td>
<td>0.780</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>AC5</td>
<td>0.667</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>RC1</td>
<td>0.693</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>RC2</td>
<td>0.737</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>RC3</td>
<td>0.690</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>RC4</td>
<td>0.749</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>RC5</td>
<td>0.666</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>OP1</td>
<td>0.722</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>OP2</td>
<td>0.653</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>OP3</td>
<td>0.649</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>OP4</td>
<td>0.745</td>
<td>0.000</td>
<td>Valid</td>
</tr>
<tr>
<td>OP5</td>
<td>0.658</td>
<td>0.000</td>
<td>Valid</td>
</tr>
</tbody>
</table>

Based on the results of validity tests show that all questionnaire items are valid with a level of significance ≤ 0.05.

According to Ghozali (2018), reliability testing is a valuable tool for testing whether or not a questionnaire is biased, which indicates a variable or construct. This test can show the extent to which the test was carried out without error or bias, which was done to ensure the consistency of measurements in the research (Sekaran & Bougie, 2016). Reliability is measured using the alpha coefficient/Cronbach Alpha (α). A variable is reliable if it shows a Cronbach’s Alpha value ≥ 0.60 (Kuncoro, 2013).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Cronbach’s Alpha</th>
<th>Cut-off value</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaboration Capabilities</td>
<td>0.704</td>
<td>0.60</td>
<td>Reliable</td>
</tr>
<tr>
<td>Integration Capabilities</td>
<td>0.716</td>
<td>0.60</td>
<td>Reliable</td>
</tr>
<tr>
<td>Agility Capability</td>
<td>0.732</td>
<td>0.60</td>
<td>Reliable</td>
</tr>
<tr>
<td>Response Capability</td>
<td>0.747</td>
<td>0.60</td>
<td>Reliable</td>
</tr>
<tr>
<td>Operational Performance</td>
<td>0.715</td>
<td>0.60</td>
<td>Reliable</td>
</tr>
</tbody>
</table>

The reliability test results show that all variables have a Cronbach’s Alpha ≥ 0.60 value, so the variables were declared reliable.
Findings and Discussions

Findings

Results of Multiple Regression Analysis

The results of multiple analyses in this research aim to prove whether or not there is an influence between collaboration capability (CC), integration capability (IC), agility capability (AC), and responsive capability (RC) on operational performance (OP). The level of significance used in this multiple regression analysis is ≤ 5%, where if the significance value is ≤ 0.05, then the hypothesis is accepted (significant), and if the significance value is > 0.05, then the hypothesis is rejected (not significant). The following are the results of multiple regression analysis in this research:

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>.721</td>
<td>1.274</td>
<td>.565</td>
<td>.574</td>
</tr>
<tr>
<td>Collaboration Capabilities</td>
<td>.247</td>
<td>.085</td>
<td>.239</td>
<td>2.918</td>
</tr>
<tr>
<td>Integration Capabilities</td>
<td>.249</td>
<td>.095</td>
<td>.185</td>
<td>2.637</td>
</tr>
<tr>
<td>Agility Capability</td>
<td>.351</td>
<td>.099</td>
<td>.390</td>
<td>3.546</td>
</tr>
<tr>
<td>Response Capability</td>
<td>.228</td>
<td>.108</td>
<td>.233</td>
<td>2.114</td>
</tr>
</tbody>
</table>

*a. Dependent Variable: Operational Performance*

Based on the data from the multiple regression results contained in Table 3., a regression equation can be formulated as follows:

\[ Y = 0.721 + 0.247X_1 + 0.249X_2 + 0.351X_3 + 0.228X_4 + e \]

The results of multiple regression analysis mean:

i. If the variable values of collaboration capability, integration capability, agility capability, and responsiveness are considered constant, then the operational performance of MSMEs in Sleman, Indonesia, will increase.

ii. The regression coefficient of collaboration capability positively influences operational performance. This shows that the better the collaboration capabilities, the higher the operational performance of MSMEs in Sleman, Indonesia. The t-test (partial) results for the collaboration capability variable were 2.918 with a significance value of 0.005 (\( \alpha = 5\% \)). This means that partial collaboration capabilities significantly positively influence the operational performance of food and beverage MSMEs in Sleman, Indonesia. Thus, hypothesis 1 is proven and accepted.

iii. The regression coefficient of integration capability positively influences operational performance. This shows that the better the integration capabilities, the higher the operational performance of MSMEs in Sleman, Indonesia. The t-test (partial) results for the integration capability variable were 2.637 with a significance value of 0.011 (\( \alpha = 5\% \)). This means that partial integration capabilities significantly positively influence the operational performance of food and beverage MSMEs in Sleman, Indonesia. Thus, hypothesis 2 is proven and accepted.

iv. The regression coefficient of agility capabilities positively influences operational performance. This shows that the better the agility capability, the higher the operational performance of MSMEs in Sleman, Indonesia. The t-test (partial) results for the agility capability variable were 3.546 with a significance value of 0.001 (\( \alpha = 5\% \)). This means that agility capabilities partially positively influence the operational performance of food and beverage MSMEs in Sleman, Indonesia. Thus, hypothesis 3 is proven and accepted.

v. The regression coefficient of responsiveness positively influences operational performance. This shows that the better the responsiveness, the higher the operational performance of MSMEs in Sleman, Indonesia. The t-test (partial) results for the responsiveness variable were 2.114 with a significance value of 0.039 (\( \alpha = 5\% \)). This means that partial responsiveness significantly influences the operational performance of food and beverage MSMEs in Sleman, Indonesia. Thus, hypothesis 4 is proven and accepted.

Discussion

Supply Chain Collaboration Capabilities and Operational Performance

According to the results of hypothesis testing, the collaboration capability variable is proven to have a significant favorable influence on the operational performance of MSMEs in Indonesia. Increasing collaboration capabilities between MSMEs and internal and external parties must be maintained to improve value from the MSMEs themselves. Epic collaboration can be an advantage that MSMEs can rely on over their competitors. Collaborating with internal and external parties can provide mutual benefits to each other regarding the supply of raw materials and the procurement of other materials that support the MSMEs' operations. Collaboration
between MSMEs and external parties can be a strategy that can help MSMEs compete better in the market, adapt to a dynamic environment, and produce products that are superior to the market. Collaborating parties will contribute to various aspects of product development.

This research supports previous research by Kareem and Kummitha (2020). This research states that applying high supply chain collaboration capabilities can face dynamic environments or environments that frequently change.

**Supply Chain Integration Capabilities and Operational Performance**

According to the hypothesis test results, the integration capability variable significantly influences the operational performance of MSMEs in Indonesia. Integrating various users in the supply chain makes it easier for organizations to meet customer needs and desires. Information systems that unite various parties are also very helpful for coordination and communication. Food and beverage MSMEs in Sleman, Indonesia, have integrated information with users externally and internally in the organization.

Establishing an information system that can integrate MSMEs and several external parties is a good strategy that can improve the operational performance of MSMEs because it can save time, energy, and materials. This practice allows MSMEs and external parties to exchange information regarding raw material supplies and procurement schedules to minimize errors and delays.

The results of this research are not supported by previous research conducted by Kareem and Kummitha (2020). Kareem and Kummitha's research were carried out in manufacturing companies, so the results differed from those of this research, whose objectives were food and beverage MSMEs. This research supports previous research by Armistead and Mapes (1993), which stated that implementing a higher supply chain integration can improve company quality and performance.

According to Frohlich and Westbrook (2001), achieving superior company performance by developing Supply Chain Integration is a significant challenge for every company. MSMEs in Sleman, Indonesia implements integration capabilities well. The research results of Frohlich and Westbrook (2001) provide direction so that there is also awareness of the critical role of supplier integration and customer integration in achieving company performance.

**Supply Chain Agility Capabilities and Operational Performance**

According to the hypothesis test results, the agility capability variable significantly influences the operational performance of MSMEs in Indonesia. Food and beverage MSMEs in Sleman, Indonesia, can quickly adapt the services or products they produce to new customer needs; MSMEs can also react quickly to market developments and act quickly with significant increases or decreases in consumer demand. Agility capabilities have been adopted in operating food and beverage MSMEs in Indonesia. Having agility capabilities makes MSMEs perform well.

This supports previous research by Kareem and Kummitha (2020). Aslam et al., 2018 also stated that supply chain agility capabilities enable companies to seize opportunities in the market, which can improve company performance. This finding is also consistent with the results of Oh et al. (2019), who argue that supply chain agility contributes to a company's operational performance through fast speed in the market and customer satisfaction.

**Supply Chain Responsive Capability and Operational Performance**

According to the results of the hypothesis test, the responsiveness variable has a significant favorable influence on the operational performance of MSMEs in Indonesia. Food and beverage MSMEs in Sleman, Indonesia, are making their performance more effective, starting by being able to meet market requirements, being able to respond well to changes in market demand, being able to deliver orders on time, and being able to reduce waiting times to fulfill customer orders. This treatment provides more value to customers and can improve the operational performance of the MSMEs themselves.

The results of this research support the results of previous research conducted by Kareem and Kummitha (2020). Aslam et al. (2018) and Hong et al. (2019) argue that a company's ability to respond quickly to changes in consumer needs and competitor strategies and develop new products quickly can improve its performance.

**Conclusions**

This research aims to determine the role of supply chain dynamic capabilities, including collaboration, integration, agility, and responsive capabilities, in improving the operational performance of MSMEs. Based on the description of the results of data analysis and discussion, the following conclusions can be drawn:

i. Supply Chain Collaboration Capability positively and significantly affects the Operational Performance of MSMEs in Sleman, Indonesia.

ii. Supply Chain Integration Capability positively and significantly affects the Operational Performance of MSMEs in Sleman, Indonesia.

iii. Supply Chain Agility Capability positively and significantly affects the Operational Performance of MSMEs in Sleman, Indonesia.
iv. Supply Chain Responsiveness Capability positively and significantly affects the Operational Performance of MSMEs in Sleman, Indonesia. The research results show that collaboration, integration, agility, and responsiveness influence the operational performance of food and beverage MSMEs. Of the four capabilities, one capability weakly influences operational performance, namely responsiveness. The author suggests that MSME players focus on increasing supply chain responsiveness. Responsive capability is the ability to act on changes in an environment in various ways, such as observing the environment, observing competitor strategies, and forecasting the environment.

The research contributes to understanding the relationship between supply chain dynamic capabilities and operational performance in food and beverage MSMEs in Sleman, Indonesia. The study provides valuable insights for MSMEs and policymakers seeking to enhance supply chain effectiveness and overall performance by demonstrating the positive influence of collaboration, integration, agility, and responsiveness on operational performance.

Limitations and Future Research:

While the study provides valuable insights, it is essential to acknowledge its limitations, such as the relatively small sample size and the focus on a specific geographical area. Future research could address these limitations by expanding the sample size and conducting comparative analyses across different regions or industries to enhance the generalizability of the findings.

Additionally, considering the dynamic nature of supply chains and business environments, longitudinal studies could provide insights into how supply chain capabilities evolve and their long-term impact on operational performance.

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