


Model of Creative Economy Supply Chain Resilience to Improve SME Sales

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INFO	ABSTRACT
Article History Received: 2024-05-29 Revised: 2024-08-20 Accepted: 2024-08-30	Supply chain resilience, which consists of robustness, flexibility, and agility, are critical to maintaining business productivity and sustainability. The objective of this research is to scrutinize the robustness and adaptability in relation to agility, in addition to examining the impact of flexibility and agility on the sales of SMEs. Data was amassed through structured interviews with 314 proprietors of food and beverage businesses in Surakarta. The analytical method utilized was one of the structural equation modeling techniques, specifically, Partial Least Square (SEM-PLS). The analytical outcomes suggest that to bolster the sustainability of food and beverage enterprises, SMEs must exhibit agility and adaptability during periods of uncertainty in the business environment, supported by a robust supply chain. Moreover, agility partially functions as a mediator in the robustness and flexibility of SMEs in relation to sales. The implications of this research underscore the necessity for support from all stakeholders in the food and beverage supply chain activities to ensure SMEs are resilient, agile, and adaptable in confronting dynamic environmental challenges.


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Keywords: Agility; Flexibility; Robustness; Sales; Supply Chain Resilience

INTRODUCTION

Creative economy SMEs in the food and beverage sector in Surakarta are operating in an increasingly complex and uncertain business environment, both internally and externally (Isa, 2023). The complexity and uncertainty of the SME business environment are evident in the rising customer demands, the advancement of digital technology, and the occurrence of disasters such as floods, the eruption of Mount Merapi, and the COVID-19 pandemic, all of which impact the performance and sustainability of SMEs (Mangifera et al., 2024). Due to the unpredictability of the business environment, SMEs must create competitive strategies focused on strengthening their supply chain resilience skills (Huma et al., 2020; Vasi et al., 2024). In order to obtain a competitive edge over their rivals, particularly in periods of unpredictability in the business environment or calamity, not many food and beverage SMEs concurrently integrate these skills into their supply chain networks (Ahmed et al., 2019; Altay et al., 2018).

Disasters and business environment uncertainties disrupt the business resilience of SMEs (Vasi et al., 2024). SME operators believe that business environment uncertainties cause many problems in business management within the supply chain, such as delays in raw materials, increased logistics costs, production stoppages, decreased market demand, and changes in customer demands (Isa, 2023; Tirkolaei et al., 2022; Wajidi et al., 2020). All these problems negatively impact the resilience of SMEs (Isa et al., 2021). There are three

concepts of supply chain resilience to maintain productivity and business sustainability, namely robustness, flexibility, and agility.

Robustness is a measure of SMEs' capacity to continue operating in the face of obstacles (Azaron et al., 2021). It is important to analyze the importance of maintaining resilience against unexpected disruptions. Agility shows the ability of SMEs to implement different and appropriate policies in the face of sudden changes to maintain and improve the performance of food and beverage businesses (Li et al., 2023). In addition, flexibility indicates the ease in finding new solutions to maintain resilience in the face of business environment uncertainties, such as floods and the COVID-19 pandemic (Sriyanto et al., 2022). Innovation enhances flexibility, which is useful in minimizing the problems experienced by companies when facing sudden disruptions.

This research emphasizes the resilience of SMEs in sustaining their operations amidst external environmental disruptions and uncertainties. The contingency theory and dynamic capabilities perspectives serve as the foundation for this investigation. According to Best et al. (2021), dynamic capabilities are the internal and external capacities to deal with quickly evolving SME situations; this gives an SME a competitive edge (Weaven et al., 2021). Contingency theory encourages risk reduction and more flexible structural changes (Liang et al., 2022), thus enabling SMEs to make quicker decisions in unexpected situations (Brandon-Jones et al., 2014). A more resilient and sustainable supply chain may arise from the implementation of these theories (Weaven et al., 2021).

SMEs must have an agile (Panigrahi et al., 2023), flexible, and robust supply chain structure (Nayeri et al., 2021; Shekarian et al., 2020) during and after disruptions. Therefore, this research identifies the relationship between robustness, flexibility, and agility to ensure SME resilience against unexpected disruptions, such as the COVID-19 pandemic, floods, and other natural disasters. This study contributes theoretically to contingency theory and the perspective of dynamic capabilities. Its contribution is to explain the influence of robustness and flexibility on agility, as well as the influence of flexibility and agility on SME sales.

LITERATURE REVIEW

Job Satisfaction and Work Environment

Dynamic capabilities theory explains the capabilities of food and beverage SMEs related to innovation and change to carry out their routine activities (Bahrami & Shokouhyar, 2022). Dynamic capabilities theory explains the role of robustness, flexibility, and agility for organizations in facing sudden disruptions (Duchek, 2020). SMEs require change to face disruptions and develop new processes to enhance supply chain resilience.

According to Dubey et al. (2021) contingency theory, uncertainty exists in everything, including supply chain organizations and processes. The ideal circumstances for processes and operations abruptly alter when faced with unforeseen disturbances like floods, earthquakes, COVID-19, and so on (Parajuli et al., 2020). When and how innovation can be achieved are understood through the application of contingency theory. This situation makes the supply chain strong, nimble, and adaptable by ensuring that adjustments or enhancements can be made to operations in accordance with current procedures and circumstances (Dubey et al., 2021; Thakur & Mangla, 2019).

Dynamic capabilities theory and contingency theory ensure the supply chain has resilience and sustainability, especially when facing sudden disruptions such as floods, earthquakes, and the COVID-19 pandemic (Abdelilah et al., 2023). In addition, dynamic capabilities theory and contingency theory form the basis for the supply chain to become robust, flexible, and agile. Therefore, this research relies on dynamic capabilities theory and contingency theory as its theoretical foundation.

Relationship between Robustness and Agility

Robustness indicates the ability of SMEs to maintain their performance despite disruptions (Azaron et al., 2021). Robustness ensures that the supply chain can “not give up” while facing disruptions. These disruptions will absorb the existing capabilities of SMEs to a certain extent, causing a decline in supply chain performance. A strong supply chain aims to continue operating even when inevitable risks cause disruptions. This research explains that robustness maintains all performance caused by disruptions (Mackay et al., 2020).

H1. Robustness has a positive effect on agility.

Relationship between Flexibility and Agility

The supply chain becomes more diverse and intricate every day. This situation implies that the supply chain needs to be more flexible. Flexibility increases sales for SMEs by enabling them to adapt to changes in the environment (Mackay et al., 2020). In the framework of contingency planning and dynamic capability theory, flexibility offers greater agility in boosting SME sales (Kazancoglu et al., 2022). As a result, the idea of "agility" is born, signifying the capacity to adjust to potential setbacks.

H2. Flexibility has a positive effect on agility.

Relationship between Flexibility and Sales

The supply chain and market are becoming more diverse and complex day by day (Bayraktar et al., 2020). This situation indicates the need for the supply chain to be more flexible. Flexibility gives SMEs the ability to respond to environmental changes and contributes to increased sales (Kamalahmadi et al., 2022) to maintain and improve their performance.

H3. Flexibility has a positive effect on sales.

The Role of Agility in Mediating Flexibility and Robustness Towards Sales

Flexibility affects agility (Shekarian et al., 2020). The lack of one of these characteristics impacts sales and sustainability. Robustness depends on agility to increase product sales (Alshahrani & Salam, 2022). Agility is present when there is flexibility.

H4. Agility mediates the relationship between flexibility and robustness towards sales.

RESEARCH METHOD

The population of this study consists of creative economy SMEs in the food and beverage sub-sector in Surakarta, amounting to 608 business units. A sample of 314 SME operators, or 51.65% of the total population, was taken. The sampling technique employed was purposive random sampling, a method of sample selection that aligns with the research

objectives, namely those who have experienced business environment uncertainties such as the COVID-19 pandemic and flood disasters and are still active until the implementation of this research.

This research utilized primary data obtained directly from the research respondents, who are food and beverage business operators in Surakarta. Data collection was conducted using structured interviews. Structured interviews for supply chain resilience analysis were conducted by directly questioning the SME food and beverage operators using a questionnaire. This study used the Partial Least Square (PLS) method in conjunction with the SmartPLS software. Latent variables, indicators, and measurement errors can all be directly evaluated using the least squares partial, one of the structural equation modeling (SEM) techniques (Hair et al., 2017; Purwanto & Sudargini, 2021). Furthermore, PLS analysis incorporates path analysis, regression analysis, and confirmatory factor analysis (CFA) (Rönkkö et al., 2023).

PLS may be used with any data, does not require a big sample size or assumptions, and can be concluded even in the absence of a theoretical foundation. The measurement model and the structural model are the two models used in PLS analysis (Mohamad et al., 2019). The link between latent variables and associated indicators is described by the measurement model, also known as the external model. The structural model, also known as the inner model as presented in Figure 1, specifies the link between latent variables based on substantive research theory.

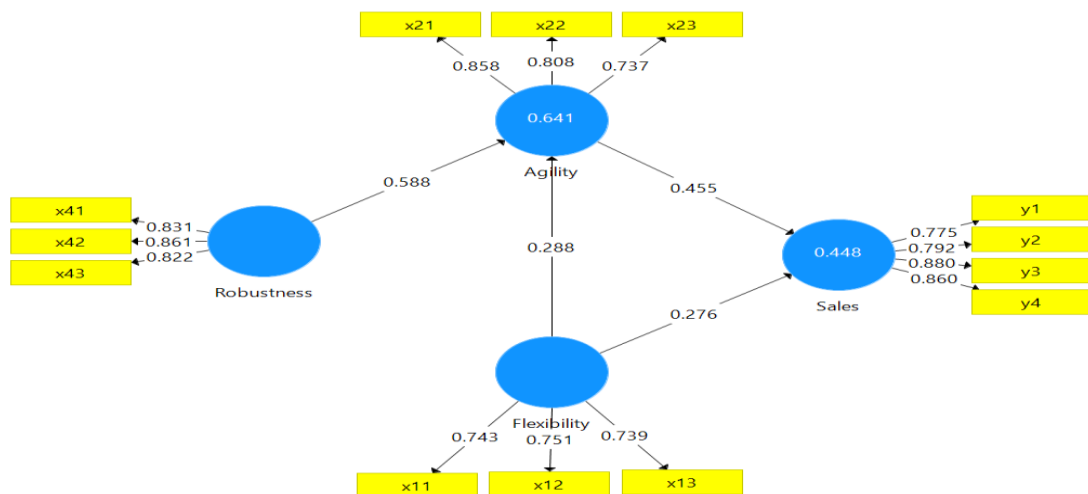


Figure 1. Inner Model

RESULTS AND DISCUSSION

Surakarta is home to 1.413 SMEs, which are almost evenly distributed across all districts. The characteristics of these SMEs, based on business types, are classified into six categories: food and beverages, product design, craft, fashion, art, and others. Surakarta has the highest number of food and beverage businesses, amounting to 608 business units or 43.03% of the total SMEs.

The respondents of this research comprised 314 SME operators or 51.65% of the total population. These are business units that have experienced business environment uncertainties, such as the COVID-19 pandemic and floods. The research respondents

consisted of 71.66% males and 28.34% females. The respondents were categorized into two business sizes: micro-businesses accounting for 85.35% and small businesses making up 14.65%. The majority of business operators had high school education (48.41%), followed by those with education up to junior high school (26.43%) and those with higher education (25.16%). Based on the duration of the business, the business operators had been established for a considerable period where 40.13% were less than 5 years old, 34.39% were between 5-10 years, 15.61% were between 10-15 years, and 9.87% were 20 years or older.

Table 1. Validity and Reliability Results

Variable	Indicator	Outer Loadings	Cronbach's Alpha	Composite Reliability	Average Variant Extracted (AVE)
Flexibility: the ease in finding new solutions to maintain resilience in the face of business environment uncertainties			0.604	0.789	0.554
	X11. Different cost policies were applied	0.743			
	X12. Changes in production planning (lengthened or shortened) were applied.	0.751			
	X13. Raw material variety was enhanced.	0.739			
Agility: the ability of SMEs in implementing different and appropriate policies in the face of sudden changes to maintain and improve the performance of food and beverage businesses			0.723	0.844	0.644
	X21. Effective solutions have been produced for sudden increases or decreased in demand.	0.868			
	X22. Efficient information sharing was achieved between customers and suppliers.	0.808			
	X23. The inventory policy was adapted to avoid stock problems.	0.737			
Robustness: The ability of SMEs to maintain their performance despite disruptions			0.788	0.876	0.702
	X31. For a long time, our supply chain retains the same stable situation as it had before changed occur.	0.831			
	X32. When changes occur, our supply chain grants us much time to consider a reasonable reaction.	0.861			
	X33. Without adaptations being necessary, our supply chain performs well over a wide variety of possible	0.822			
Sales: average growth of market share, profit dan turn over			0.846	0.897	0.685
	Y1. Average market share growth	0.775			
	Y2. Average sales volume (units) growth.	0.792			
	Y3. Average profit growth.	0.880			
	Y4. Average turnover growth	0.860			

The study's validity and reliability tests (Table 1) showed that the variables and questionnaires employed are both reliable and valid. In order to verify that the research data is normal and to meet data assumptions, data analysis was also done. When an indicator's outer loading value is more than 0.7, it is considered valid according to convergent validity.

Based on the analysis results, all of the indicators are found to be valid. A variable is also considered reliable if its composite reliability value, or Cronbach's alpha, is more than 0.7, while 0.6 is still considered acceptable. Furthermore, according to Mangifera et al. (2024), an indicator is deemed legitimate in terms of discriminant validity if it possesses a high correlation with its structure and an Average Variance Extracted (AVE) value larger than 0.5.

All the variables under study, namely flexibility, agility, robustness, and sales, exhibit Average Variance Extracted (AVE) values greater than 0.5, thereby confirming their validity. The Cronbach's alpha values for the Agility, Robustness, and Sales variables exceed 0.7, and the Flexibility variable is greater than 0.6, thus establishing the reliability of all variables. Moreover, all variables demonstrate composite reliability values exceeding 0.7, further affirming the reliability of the research variables.

The results of the multicollinearity test, as shown in Table 2, indicate a Variance Inflation Factor (VIF) value less than 5. Therefore, it is concluded that this research model does not exhibit multicollinearity.

Table 2. Multicollinearity Results

Inner VIF Values	VIF	Description
Agility -> Sales	1.756	No Multicollinearity
Flexibility -> Agility	1.643	No Multicollinearity
Flexibility -> Sales	1.756	No Multicollinearity
Robustness -> Agility	1.643	No Multicollinearity

The goodness of fit, effect size test (F^2), and hypothesis test (T-Test, direct and indirect effects) are utilized to evaluate the model.

Goodness of fit

The Coefficient of Determination (R^2) value lies between 0 and 1, with R square values below 0.33 - 0.19 indicating low values, then 0.33 - 0.67 indicating moderate values, while values above 0.67 indicate strong values.

Table 3. R-Square

	R square	R square adjusted
Agility	0.641	0.639
Sales	0.448	0.444

The R square value is used to observe the magnitude of the influence of robustness and flexibility on agility, which is 0.641 (Table 3), thus indicating a moderate value. The level of influence of agility and flexibility on sales is 0.448, which means it has a moderate influence.

Using the same interpretation as regression, the goodness of fit test measurement used the dependent latent variable's R square. The construct model's Q square predictive relevance quantifies how well the model's parameter estimations and observation values match up. A model's predictive relevance is shown by a Q square value greater than 0. The range of the magnitude of Q-square is $0 < Q^2 < 1$.

$$Q \text{ square} = 1 - [(1 - R_1^2) \times (1 - R_2^2)]$$

$$Q \text{ square} = 1 - [(1 - 0.641) \times (1 - 0.448)]$$

$$\text{square} = 1 - [(0.359) \times (0.552)]$$

$$\text{square} = 1 - [(1 - 0.160)]$$

$$\text{square} = 0.84$$

According to the computation above, the Q square value is 0.84, or 84%, falling between 0 and Q2 and 1.84% of the model's diversity, as demonstrated by the independent variable, explains the dependent variable, with the remaining 16% being impacted by external factors. This computation proves that the research model, as claimed, has predictive relevance.

Effect Size Test (F²)

The magnitude of the influence between variables is assessed using the effect size test with an f square value of 0.02 as small, 0.15 as medium, and 0.35 as large (Mangifera et al., 2024).

Table 4. F Square

	F square	Description
Agility -> Sales	0.214	Moderate
Flexibility -> Agility	0.141	Moderate
Flexibility -> Sales	0.078	Small
Robustness -> Agility	0.586	Large

To observe the degree of influence between variables, one uses the F square value. The influence value of the Agility variable on sales is 0.214, which is considered moderate. The influence value of the Flexibility variable on agility is 0.141, also considered moderate; the influence value of flexibility on sales is 0.078, considered small, and the influence value of robustness on agility is 0.586, considered large (Table 4).

Hypothesis Testing

This research employed the T-Test, direct effects, and indirect effects for hypothesis testing (Hair et al., 2017).

T-Test

The T-Test is said to have a significant influence if the T-statistic value is > 1.988 (T-Table), and if the T-statistics value is < 1.988 (T-table), then it is considered to have an insignificant influence (Mangifera et al., 2024).

Table 5. T-Statistics

	T-statistics	T-tabel	Description
Agility -> Sales	7.849	1.988	Significant
Flexibility -> Agility	5.228	1.988	Significant
Flexibility -> Sales	4.596	1.988	Significant
Robustness -> Agility	11.544	1.988	Significant

The T-statistics values indicate the significance of the influence between the variables. Sales are positively and significantly impacted by agility (T-statistic value of 7.849 > 1.988), flexibility positively and significantly impacted by agility (T-statistic value of 5.228 >

1.988), flexibility positively and significantly impacted by agility (T-statistic value of 4.596 > 1.988), and robustness positively and significantly impacted by agility (T-statistic value of 11.544 > 1.988) (Table 5).

Direct Effect

The notion of the direct influence of exogenous variables on endogenous variables is examined through the application of direct effect (Hair et al., 2017). When the path coefficient value is positive, it indicates that the variables have a positive influence on one another. Specifically, when the exogenous variable's value rises, the endogenous variable's value rises as well, and when the exogenous variable's value falls, the endogenous variable's value falls as well. P-values are considered significant if they are less than 0.05 (5%) and not significant if they are greater than 0.05 (5%), according to Mangifera et al. (2024).

Table 6. Direct Effects

	Original sample	P-values	Description
Agility -> Sales	0.455	0.000	Positively significant
Flexibility -> Agility	0.288	0.000	Positively significant
Flexibility -> Sales	0.276	0.000	Positively significant
Robustness -> Agility	0.588	0.000	Positively significant

The original sample values and p-values indicate the direct influence between variables. The analysis results of the direct influence of Agility on Sales show a positive original sample and p-values < 0.05, indicating a positive and significant relationship. The direct influence of Flexibility on Agility has a positive original sample and p-values < 0.05. The direct influence of Robustness on Agility has a positive original sample and p-values < 0.05. Therefore, the relationships between these variables are positive and significant (Table 6). The increase in the flexibility and robustness variables will have an impact on the increase in the agility variable, which will then increase sales. Likewise, the flexibility variable will increase sales of SMEs for food and beverage products.

Indirect effect

Examining the hypothesis regarding the indirect influence of exogenous variables on endogenous variables that are mediated by intervening variables can be done with the help of the indirect effect analysis. It is significant if the p-value is less than 0.05. Accordingly, the intervening variable serves to mitigate the exogenous variable's impact on the endogenous variable. Put otherwise, the impact is not direct. The p-value is considered non-significant if it is higher than 0.05 or 5%. The mediator variable has a direct influence rather than an exogenous one (Hair et al., 2017).

Table 7. Indirect Effects

	Original sample	P values	Description
Flexibility -> Agility -> Sales	0.131	0.000	Positively significant
Robustness -> Agility -> Sales	0.268	0.000	Positively significant

The results of the indirect effects analysis of the Flexibility variable on Sales, mediated by agility, show an original sample value of 0.131 with p-values 0.000 < 0.05 (Table 7), indicating a positive and significant relationship. The Robustness variable's effect on Sales,

mediated by agility, shows an original sample value of 0.268 with p-values < 0.05, indicating a positive and significant relationship.

The development of information technology, floods, tornadoes, Mount Merapi, and the COVID-19 pandemic that occurred in Surakarta and surrounding areas have had an impact on the level of complexity and uncertainty of the food and beverage business. This condition affects the performance of the supply of food and beverage SMEs in Surakarta. The supply chain that is not optimal has an impact on the level of business resistance, which threatens the level of sales and sustainability of SMEs. This condition is especially true in the face of sudden natural disasters. Business actors who have a more flexible and agile attitude will increase the resilience and sustainability of the supply chain (Alshahrani & Salam, 2022).

The uncertainty of the business environment, such as the COVID-19 pandemic, tornadoes, Mount Merapi, and floods in the city of Surakarta and its surroundings, causes business actors in supply chains to change strategies and new plans to maintain resilience in dealing with disturbances (Nandi et al., 2021). The resilience of business actors in the supply chain in the face of disturbance depends on robustness, flexibility, and agility (Alshahrani & Salam, 2022). Although there is a threat of change that comes suddenly, SMEs with robustness, flexibility, and agility will be able to overcome disorders (Sarkis et al., 2020).

The results of this study strengthen various previous research findings for different products and different locations. According to Nandi et al. (2021) and Azaron et al. (2021), robustness ensures that the supply chain of food and drink can "not give up" on disturbances so that it has a positive effect on agility. Mulyono and Syamsuri (2023) explained robustness as related to agility. Robustness and dexterity allow food and drink SMEs to fight sudden difficulties, fight threats in the market environment, and use this change for their benefit as a result of variations that arise. Kamalahmadi et al. (2022) stated that flexibility is the ability to adapt to fluctuations in loss of low flow in time, cost, and sales. Flexibility affects the dexterity of SMEs in increasing sales (Kazancoglu et al., 2022). With this, "agility" symbolizes the ability to deal with external environmental disorders that occur. Mulyono and Syamsuri (2023) determine the relationship between flexibility and agility and state that flexibility and agility can overcome disorders from a supply chain perspective.

The flexibility of food and beverage SMEs in responding to or adapting to changes in the external environment has a positive influence on increasing sales (Kamalahmadi et al., 2022), and this has an important role to play in improving their performance. Furthermore, this study also strengthened the role of agility in mediating robustness and flexibility (Alshahrani & Salam, 2022) in the sale of SMEs for food and beverage products.

CONCLUSION

This research concluded that robustness and flexibility influenced agility in the sustainability of food and beverage businesses during periods of business environment uncertainty. The analysis further indicated that the association between flexibility and sales was mediated by agility. The analysis explained that agility acts as a partial mediating variable influencing robustness and flexibility towards sales.

To ensure the resilience of SMEs during disruptions, they can be robust with a better sustainable system. SMEs can become strong, agile, and flexible; thus, SMEs should provide

these characteristics in all their supply chains, thereby directing them towards digital transformation. Enhancing supply chain logistics operations is necessary to guarantee the sustainability and resilience of food and beverage SMEs. All parties involved in the food and beverage supply chain must get moral and financial support in order to establish robustness, flexibility, and agility in the chain. SMEs must include the ideas of robustness, flexibility, and agility in their supply chain procedures due to the impact of COVID-19 volatility. SMEs face significant challenges in meeting demand. As such, they must utilize reserve capacity and be ready to adapt to unforeseen disruptions, such as the COVID-19 pandemic, by taking alternative actions. In periods of uncertainty, agility not only affects supply chain resilience but also sustainability.

During times of disaster, the challenges faced by SMEs double. These threats directly impact sales. Therefore, to be resilient and sustainable, SMEs must be robust, flexible, and agile. SMEs need to have a more organized and efficient risk management approach in light of this. SMEs in the food and beverage industry also need to concentrate on developing resilience. First, they must evaluate the robustness, adaptability, and agility of their sales in order to guarantee supply chain resilience.

SMEs are dynamic structures with multiple levels and stakeholders that are constantly subject to unpredictability and shocks. Thus, research investigating the digital transformation of supply chain resilience can draw theoretical support from the combination of dynamic capacities theory and contingency theory. Consequently, supply chain resilience studies of any kind can incorporate both contingency theory and dynamic capacities. This study strengthens the view of the contingency theory and dynamic capacity in maintaining the performance and sustainability of SMEs.

This study is limited in providing a comprehensive picture of food and beverage SMEs because it only focuses on micro-businesses and small businesses that produce non-durable goods. In addition, the study does not distinguish between SMEs that are in one cluster or not. Further research can be conducted on supply chain resilience not only in SMEs but also in large businesses. In addition, future researchers can conduct research on the differences in the resilience of SMEs that are in clusters or not in SME clusters.

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