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Implementation of Supply Chain Management on MSME Business Performance in Madura for Sustainable Futures

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Abstract: This study examined the role of supply chain management (SCM) in improving the performance of micro, small, and medium enterprises (MSMEs) in Madura, a region with unique economic challenges. This study used a quantitative approach with a survey of 58 MSMEs in the Madura coastal region. This study used four main variables in SCM: trust, relationships with customers, information sharing, and internal integration. The study results showed that the trust and internal integration variables positively and significantly affect MSME business performance. Trust between suppliers and MSMEs will increase operational efficiency and flexibility in managing the raw materials. Meanwhile, the variables of customer relations and information sharing, on the other hand, did not significantly affect MSME business performance. This study filled the gap in references related to SCM in MSMEs located in areas with limited facilities and infrastructure, such as Madura, which is rarely discussed. The practical implications of the findings of this study illustrated that MSMEs in Madura, especially around the coast, need to prioritize trust with suppliers and internal integration in their operational activities. Apart from that, it is hoped that MSMEs can invest in supporting technology and participate in training to increase their competitiveness. These findings provided new benefits for adapting SCM strategies to areas with limited resources.

Keywords: Business Performance, Management, MSMEs, Implementation, Supply Chain.

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A. INTRODUCTION

In large countries and developing countries, MSMEs make a significant contribution. MSMEs are important in increasing income, reducing unemployment, alleviating poverty, and increasing entrepreneurship. The increasingly rapid growth of MSMEs will impact competitive competition between MSME business actors. Improving performance and increasing capacity, namely financial, management, and professional capacity, are necessary for MSME players to ensure business continuity. Business performance is the ability of a business to achieve predetermined goals by utilizing its resources efficiently and effectively [1].

This level of achievement is used as an indicator of the extent to which the company can create the standards desired by customers while still considering costs, quality improvements, and time limits [2]. Performance results can be obtained from each specific period to be used as a benchmark for whether the strategy implemented by MSMEs is being

implemented well and successfully or if improvements are needed for the next period. There are many strategies that MSMEs can implement to survive and compete in the global market.

Implementing Supply Chain Management (SCM) is a strategy businesses can use to achieve company goals. Supply Chain Management is a chain of companies that work together to realize and deliver a product to the end user. These companies usually include suppliers such as factories, distributors, stores, and retailers [3]. The SCM network consists of all parties involved in the process, either directly or indirectly, including producers. Suppliers, retailers, customers, and other stakeholders produce and deliver products or services to end customers, facilitating upstream and downstream processes through physical distribution, information exchange, and financial flows [4].

SCM focuses on management relationships for all supply chain management chain parties to create optimal results and profits for business actors. The SCM concept can be used to improve MSME business performance. Therefore, researchers are interested in studying the Implementation of Supply Chain Management on MSME Business Performance in Madura.

B. METHOD

The data in this research was collected by distributing questionnaires to MSME owners in the Madura coastal region. A structured survey method was used to collect data, which enabled researchers to obtain quantitative data about the implementation of supply chain management (SCM), which impacts MSME business performance. Sampling was done using a purposive sampling technique, where samples were taken based on certain researchers' criteria. The sample selected was 58 MSMEs, considered representative of the MSME population in the Madura coastal region. This sample size was determined based on the estimate of around 200 to 300 MSMEs in the Madura coastal region. Different types of small and medium enterprises (MSMEs) were included in the sample based on their size, market reach, and involvement in various supply chains. This provided fairly broad coverage for MSMEs in Madura. The purposive sampling technique has limitations, so the results cannot be generalized to all MSMEs in Madura. Therefore, the findings of this study cannot be generalized directly to all business sectors; it is better to see it as a picture of MSMEs in certain industries. This study analyzed data using the SPSS (Statistical Package for the Social Sciences) analysis tool. This research used tests of validity, reliability, normality, heteroscedasticity, multicollinearity, and multiple regression analysis. The following is a further explanation of the reasons for using this statistical instrument:

1. Validity test

The validity test is carried out to evaluate whether the measurement instrument used in this research, namely the questionnaire, can measure what it is supposed to measure. Validity testing in this context ensures that each item in the questionnaire accurately reflects the SCM concept and MSME business performance. Validity test results are very important to ensure that the data collected is reliable for analysis. Each item's correlation value (calculated r) is compared with the table r value; items with a calculated r value greater than the r table are considered valid [2].

2. Reliability test

Reliability tests ensure that the research results are reliable and that the variables in the questionnaire consistently measure the same value at each questionnaire completion. The value in Cronbach's Alpha is considered reliable if it has a value above 0.6[5].

3. Normality test

The normality test determines whether the data collected has a normal distribution. Data normality is an important assumption in multiple regression, as it provides more accurate and reliable results. This study used Kolmogorov-Smirnov to test normality. If the significance value is greater than 0.05, the data is considered to be normally distributed [6].

4. Heteroscedasticity test

A heteroscedasticity test is carried out to determine whether there is an inequality of residual variance in the regression model. Due to heteroscedasticity, inaccurate or inefficient regression results can be produced. This test is very important to ensure the regression results can be interpreted correctly. This research tested heteroscedasticity using the scatterplot method. The results showed that there is no problem with heteroscedasticity [7].

5. Multiple regression analysis

Multiple regression analysis measures the influence of several independent variables on one dependent variable. In this research, trust, customer relationships, information sharing, and internal integration are all independent variables that influence MSME business performance. Multiple regression is suitable because it allows researchers to test all variables simultaneously and know the researcher's main goal. [8]

C. RESULTS AND DISCUSSION

1. Statistical analysis

Varibel	Item Pernyataan	Nilai Kritis	Rtabel (N-2)=58-2=56	Keterangan
Hubungan dengan pelanggan (X1)	X.1	0,804	0,2586	Rhitung > rtabel= valid
	X.2	0,808	0,2586	Rhitung > rtabel= valid
	X.3	0,760	0,2586	Rhitung > rtabel= valid
Berbagi Informasi (X2)	X.1	0,722	0,2586	Rhitung > rtabel= valid
	X.2.	0,770	0,2586	Rhitung > rtabel= valid
	X.3	0.791	0,2586	Rhitung > rtabel= valid
	X.4	0.708	0,2586	Rhitung > rtabel= valid
Kepercayaan (X3)	X.1	0,797	0,2586	Rhitung > rtabel= valid
	X.2.	0,778	0,2586	Rhitung > rtabel= valid
	X.3	0,773	0,2586	Rhitung > rtabel= valid
Integrasi Internal (X4)	X.1	0,771	0,2586	Rhitung > rtabel= valid
	X.2.	0,821	0,2586	Rhitung > rtabel= valid
	X.3	0,852	0,2586	Rhitung > rtabel= valid
	X.4	0,725	0,2586	Rhitung > rtabel= valid
Kinerja Usaha (Y)	Y.1	0,674	0,2586	Rhitung > rtabel= valid
	Y.2.	0,690	0,2586	Rhitung > rtabel= valid
	Y.3	0,754	0,2586	Rhitung > rtabel= valid
	Y.4	0,725	0,2586	Rhitung > rtabel= valid

Figure 1. Validity Test Results

a. Validity test

This Figure 1 shows the results of validity tests on research variables: Relationship with Customers (X1), Information Sharing (X2), Trust (X3), and Internal Integration (X4). Each variable has several statement items that are used to test its validity. In testing its validity, the calculated R-value of each item is compared with the R table value of 0.2586. The calculation results show that all items have an Rcount value greater than Rtable. This shows that all the statements are valid. Therefore, the research instruments used have been proven to measure these variables accurately. The collected data can now be used for advanced analysis.

b. Reability test

Variabel	Nilai Cronbach's Alpha	Keputusan
Hubungan Dengan Pelanggan	0,697	Reliabel
Berbagi Informasi	0,726	Reliabel
Kepercayaan	0,682	Reliabel
Integrasi Internal	0,745	Reliabel
Kinerja Usaha	0,673	Reliable

Figure 2. Reability Test Result

This Figure 2 shows the results of reliability tests using Cronbach's Alpha values on several research variables, such as Relationships with Customers, Information Sharing, Trust, Internal Integration, and Business Performance. The Cronbach's Alpha value obtained for each variable shows that all items in these variables are declared reliable. The Cronbach's Alpha value for each variable is as follows: Relationship with Customers (0.697), Information Sharing (0.726), Trust (0.682), Internal Integration (0.745), and Business Performance (0.673). All variables are declared reliable based on these values because Cronbach's Alpha exceeds the minimum reliability standard, 0.6. This shows that the instrument used has good internal consistency in measuring the research variables.

2. Analysis prerequisites

a. Normality test

		Unstandardized Residual
N		58
Normal Parameters[a,b]	Mean	,0000000
	Std. Deviation	1,64776126
Most Extreme Differences	Absolute	,083
	Positive	,044
	Negative	-,083
Test Statistic		,083
Asymp. Sig. (2-tailed)		,200[c,d]

Figure 3. Normality Test Result

The results of the data normality test using the One-Sample Kolmogorov-Smirnov Test indicate that the residual data is normally distributed. The significance value (Asympt. Sig. (2-tailed)) is 0.200, which is greater than the threshold of 0.05. Therefore, it can be concluded that the residual data satisfies the normality assumption. This means that statistical analyses requiring normally distributed data, such as linear regression, can be validly conducted.

b. Heteroscedastivcity result

This shows that the data tested does not show heteroscedasticity problems. In this case, the independent variable does not affect the error variability; The Relationship with Customers variable has a significance value of 0.551, the Information Sharing variable is 0.388, the Trust variable is 0.560, and the Internal Integration variable is 0.075. All these significance values are greater than the 0.05 limit. In other words, there is no heteroscedasticity because the residual variability, or error, is constant across independent variable levels. This shows that the regression model used is valid and has a good fit between the dependent variables (internal integration, trust, relationships with customers, and information sharing) and the independent variables. This model meets important assumptions about linear regression, and the regression analysis results can be understood more accurately.

c. Multicollinearity result

The multicollinearity test determines whether the regression model shows a high or near-perfect correlation between the independent factors. Data is considered multicollinearity in regression analysis if, when tested, there is a high correlation between independent factors. If there is no correlation or it is free from multicollinearity, the test is considered passed.

The data in the table above has obtained the results of the multicollinearity test. The relationship factor between customers has a tolerance level of 0.763 with a VIF of 1.311. The information sharing variable has a tolerance level of 0739 with a VIF of 1.353, the trust and distribution variable has a tolerance value of 0.814 with a VIF of 1.229, and the internal integration factor's tolerance value is 0.855 with a VIF of 1.270. Therefore, it can be concluded that all independent factors have a tolerance value greater than 0.1 (> 0.1) and a VIF value less than 10 (> 10). In other words, the collected data does not show signs of multicollinearity or has fulfilled the multicollinearity requirements in the regression model. The tolerance level is 0.763, with a corresponding variance inflation factor (VIF). Therefore, it can be concluded that there is no multicollinearity in all variables.

d. Multiple regression test

Three independent variables are used to assess the influence of the independent variable on the dependent variable. This analysis method is known as the multiple linear regression test. The results of the regression equation are as follows:

$$Y= 9.120 + (-0.016)X1 + (-0.168)X2 + 0.404X3 + 0.344X4$$

Based on the previously mentioned equation, it can be shown that the constant obtained is valuable9,120, which means that if relationships with customers (X1), information sharing (X2), trust (X3), and internal integration (X4) are 0, then revenue is 9,120. Furthermore, the regression coefficient value for the customer relationship factor (X1) is -0.016; this means that every 1 unit increase in customer relationships (X1) will increase business performance (Y) by -0.016. The coefficient for the information sharing factor (X2) is -0.168; this means that every 1 unit increase in information sharing (X2) will increase business performance (Y) by -0.168. The coefficient for the trust variable (X3) is 0.404; this means that every 1 unit increase in trustworthiness (X3) will increase business performance (Y) by 0.404. Likewise, with the internal integration variable (X4), an increase in distribution by 1 unit (X3) will increase business performance (Y) by 0.344.

3. Hypothesis test

a. Coefficient of determination

The adjusted square value is 0.255, or 25.5%, based on the results of the determination coefficient test, as shown in the table above. This means that the ability of all independent/free variables in this research simultaneously has an influence of 25.5% on the dependent/dependent variable. Meanwhile, the remaining difference of 74.5% (1-0.255) was influenced by additional factors not discussed in this research.

b. F test

The final result of the previous calculations shows the results of the F calculation test, which is useful for finding out the relationship between independent variables simultaneously, including the Relationship with customers (X1), information sharing (X2), Trust (X3), and Internal Integration (X4) with the dependent variable is Business Performance (Y). The percentage distribution value for this research is 2.543. The final result of the ANOVA test shows that the F value obtained from the calculation is 5.869 > f table 2.543, and the sig. The value is 0.001 < 0.05. The customer relationship variables, information sharing variables, trust variables, and internal integration variables together or simultaneously influence MSME business performance.

c. T test (partial)

The t-test results show how big the correlation or relationship is between the independent and dependent factors. In this research data, the percentage value of the t-table distribution is 2.006. The test results are as follows:

d. T-test variable Relationship with customers

The calculated t value of the relationship factor with customers is - 0.116 < 2.006 t table and the significance is 0.908 > 0.05. This shows that H0 is accepted, so it can be concluded that the relationship variable with customers does not affect the business performance of MSMEs in the Madura coastal region.

e. Information sharing variable t-test

The calculated t value of the information sharing factor is -1.723 < 2.006 t table, and the significance is 0.091 > 0.05. This shows that H0 is accepted, so it can be concluded

that the information-sharing factor does not affect the business performance of MSMEs in the Madura coastal region.

f. Trust variable t-test
The calculated t value of the trust factor is 2.802 > 2.006 t table, and the significance is 0.007 < 0.05. This shows that H0 is rejected, so it can be concluded that the trust factor influences business performance in MSMEs in the Madura coastal region.

g. Internal integration variable t-test
The calculated t value of the internal integration factor is 2.136 > 2.006 t table and the sig. is 0.003 < 0.05. This shows that H0 is rejected, so it can be concluded that the internal integration factor influences business performance in MSMEs in the Madura coastal region.

4. Discussion

The research results showed that the two main elements of supply chain management (SCM), trust and internal integration, significantly positively influence the business performance of MSMEs in Madura. In contrast, relationships with customers and data exchange do not significantly influence business performance. These results require a more in-depth analysis to understand why some parts of the SCM have a significant impact while others do not.

a. Relationship with customers
Information sharing is crucial to supply chain management (SCM) as it facilitates transparency, coordination, and operational efficiency. However, research suggests that information dissemination does not significantly impact the performance of Madura's micro, small, and medium enterprises (MSMEs). This result may be attributed to various factors. One of these factors is the limited access to information technology, which hinders MSMEs in Madura from utilizing technological systems like digital platforms or SCM software to share information with their suppliers and customers effectively. Additionally, many MSMEs in Madura have a lower level of education and may not fully comprehend the importance of sharing information effectively within the supply chain. MSMEs may fail to recognize the immediate value of information sharing with their supply chain partners without a proper understanding. Moreover, strong trust between business partners greatly influences effective information sharing. If trust between MSMEs and their supply chain partners is lacking, information sharing will be less effective and underutilized in enhancing performance.

b. Information sharing
Information sharing is essential to supply chain management (SCM) as it facilitates transparency, coordination, and operational efficiency. However, research indicates that the performance of micro, small, and medium enterprises (MSMEs) in Madura is not significantly impacted by the dissemination of information. This outcome can be attributed to several factors. One of the factors is the limited access to information technology, which hinders MSMEs in Madura from leveraging technological systems, such as digital platforms or SCM software, to share information with their suppliers

and customers effectively. Additionally, many MSMEs in Madura have a lower level of education and may not fully comprehend the significance of sharing information effectively within the supply chain. MSMEs may not recognize the immediate value of properly sharing information with their supply chain partners. Furthermore, effective information sharing often relies on high trust between business partners. If trust between MSMEs and their supply chain partners is not well-established, the effectiveness and utilization *of information sharing for performance improvement will be compromised.*

D. CONCLUSIONS AND SUGGESTIONS

This study provided important insights into how supply chain management (SCM) influences the performance of micro, small, and medium enterprises (MSMEs) in coastal Madura. The results showed that the SCM components, namely trust and internal integration, positively and significantly impact MSME business performance. The trust between MSME players and suppliers increases operational efficiency, while internal integration between departments in the business increases productivity and reduces operational costs. In addition, the findings of this study indicated that relationships with customers and information sharing do not significantly affect business performance. The results showed that MSMEs in Madura face many problems, such as limited infrastructure, technology, and human resources. These limitations can hinder the implementation of better SCM practices. Thus, this research complemented the lack of literature on SCM in MSMEs in less developed regions. It also provides practical suggestions to MSME actors on improving their performance in an increasingly competitive market.

This research's main contribution emphasized the importance of building trust and increasing internal integration in the MSME supply chain in Madura. The recommendations can help MSMEs implement more sustainable strategies to overcome current challenges. Future research should focus on the role of technology in enhancing the implementation of supply chain management (SCM), particularly for micro, small, and medium enterprises (MSMEs) in rural areas. Leveraging digital technology such as cloud-based SCM systems, e-commerce platforms, and mobile applications could be highly beneficial in addressing current limitations. Additionally, further research could explore how training and education in SCM technologies can assist MSMEs in adopting industry best practices. Given the increasingly competitive global economy, this research has the potential to significantly impact the growth of MSMEs in Indonesia and enhance national competitiveness.

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