

## The Effect of Green Supply Chain Management on Business Performance and Competitiveness in Malang SMEs

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### **Abstract**

*The purpose of this study was to determine the effect of green supply chain management on business performance and competitiveness in the chips SME industry in Malang city. This type of research uses explanatory research with a quantitative approach. The number of samples used 72 respondents. Respondents in this study are business owners who have operated for more than 2 years. The source of data in this study was obtained from the distribution of questionnaires (primary data). The data analysis technique used Structural Equation Model (SEM) based on Partial Least Square (PLS). The results show that green supply chain management has a significant positive effect on SME business performance and SME competitiveness. Competitiveness has a significant positive effect on SME business performance, and green supply chain management has a significant positive effect on business performance mediated by the SMEs competitiveness.*

**Keywords:** *green supply chain management, business performance, competitive advantage*

### **Abstrak**

Tujuan dari penelitian ini adalah untuk mengetahui pengaruh green supply chain management terhadap kinerja usaha dan daya saing pada industri UKM keripik di kota Malang. Jenis penelitian ini menggunakan explanatory research dengan pendekatan kuantitatif. Jumlah sampel yang digunakan 72 responden. Responden dalam penelitian ini adalah pemilik usaha yang sudah beroperasi lebih dari 2 tahun. Sumber data dalam penelitian ini diperoleh dari penyebaran kuesioner (data primer). Teknik analisis data menggunakan Structural Equation Model (SEM) berbasis Partial Least Square (PLS). Hasil penelitian menunjukkan bahwa green supply chain management berpengaruh positif signifikan terhadap kinerja bisnis UKM dan daya saing UKM. Daya saing berpengaruh positif signifikan terhadap kinerja bisnis UKM, dan manajemen rantai pasokan hijau berpengaruh positif signifikan terhadap kinerja bisnis yang dimediasi oleh daya saing UKM.

Kata kunci: *green supply chain management, kinerja usaha, daya saing*

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## **INTRODUCTION**

The role of the industrial sector in economic development in various countries is very important because the industrial sector has several advantages in terms of accelerating development (Muhtamil, 2017). The existence of industrial development will spur and lift the development of other sectors (Muhtamil,

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2017). One of the triggers for the development of the industrial sector is the current technological advancements. Technological advances make it easier for company owners to carry out all activities in the manufacturing industry sector, especially when carrying out company operational activities. An increase in industrialization causes environmental degradation and poses a significant threat to the surrounding environment. Therefore, a green industry concept is needed in every business process (Puryono & Kurniawan, 2017).

The concept of green industry must be applied in every business process by business owners engaged in the industrial sector, especially in the supply chain, which is known as green supply chain management. According to Punjawan (2005), the supply chain is a network of the entire organization, from suppliers to end users, in which there is a flow and transformation of materials, information, and money. Every activity carried out by supply chain managers can create waste and hazardous materials for the surrounding environment. Therefore, the concept of green supply chain management is suitable for use in overcoming environmental problems in the supply chain. Green Supply Chain Management (GSCM) is a traditional supply chain concept that is integrated with environmental aspects, which include product design, supplier selection, material procurement, manufacturing activities, packaging activities, product delivery activities to consumers, and end-of-life products. Specifically, the consumers themselves (Sundarakani, 2010).

Green supply chain management not only aims to reduce the environmental impact caused by supply chain activities, but also can create competitiveness and high business performance for owners (Jumady & Fajriah, 2020). The application of green supply chain management helps increase the value of green innovation, has a good impact on the organizational environment, and improves internal efficiency including environmental and operational efficiency so that later this efficiency leads to increased performance within an organization, especially in terms of finance (Feng, 2018). Green supply chain management is the basic pattern for companies to implement a win-win strategy in achieving profits and market share goals while reducing the risk of environmental impacts and increasing ecological efficiency. For now, the application of green supply chain management is very important to be used in various scales and business sectors because it successfully helps increase company profitability and improve company reputation (Li, 2020).

To participate in sustainable growth, green supply chain management must also be implemented by all sectors and business scales, including micro, small, and medium enterprises (MSMEs) (Heriyanto & Noviardy, 2019). Where MSMEs have a key role in securing the economy in a country, this condition can be seen from the contribution of MSMEs that have provided many positive things for the Indonesian economy, which contributed 57–60% to GDP (Gross Domestic Product), then contributed 97% to the absorption rate of the total workforce in Indonesia (Sarwono, 2015). The application of the concept of green supply chain management will create improvements for MSMEs in various aspects, one of which is improving the environment and supply chain performance (Epoh & Mafini, 2018).

Malang City is one of the cities that is famous for its agro-industry, one of which was chips made from beans called tempe. MSMEs in Malang City, which are known for their tempe chips, are in the Sanan chip industry center. Sanan village has the potential to improve the regional economy through micro, small and medium enterprises as well as an increase in community welfare (Mariana, 2009). Based on data from the Sanan tempe chip community, there are 72 MSME owners in the Sanan industrial center which have been established for 2 minimum years.

MSMEs in the Sanan tempe industrial center involve complex business processes, ranging from procurement activities, manufacturing activities, distribution activities, and reverse logistics activities. The

supply chain activities carried out by the Sanan tempe chip SMEs are still many activities that are not yet environmentally friendly. In the activity of procuring raw materials, suppliers providing soybeans have not yet implemented appropriate environmental quality standards. Manufacturing activities, management of solid waste from soybean skins is still done traditionally by giving it to animal feed, while liquid waste from soaked soybeans is directly dumped into rivers and sewers without being reprocessed, so that the rivers in the Sanan area are polluted with liquid waste and livestock manure. In distribution activities, the packaging used is still not paying attention to environmental-friendly aspects, so it is difficult to decompose again. In reverse logistics activity, the Sanan tempe chips SMEs have not implemented a re-handling system for products whose mass consumption is depleted and unfit for consumption.

Conditions like this indicate that there must be a good implementation of green supply chain management in the Sanan tempe chip SMEs. Green supply chain management integrates supply chain management with environmental management, so it is important to be done by all industrial sectors because it can reduce the impact of damage to the environment. Various previous studies also suggest that green supply chain management not only affects environmental factors but also has a significant effect on increasing competitiveness and business performance for a company (Jumady & Fajriah, 2020).

## LITERATURE REVIEW

According to Srivastava (2007), green supply chain management is defined as integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of final products to consumers, as well as end-of-life management of products. The implementation of green supply chain management has several operational functions and supporting activities, including green procurement, green manufacturing, green distribution, and reverse logistics (Ninlawan, 2010). The supporting activities of green supply chain management can be described as first, green procurement is one of the solutions for environmentally and economically conservative businesses and the concept of obtaining a choice of products and services that minimizes environmental impact. Ninlawan (2010) activities in green procurement include: 1). Selection of suppliers in a green procurement system, suppliers where materials are purchased that have environmental quality standards and pass the audit process; consider suppliers who have received ISO and certificates related to achievements in implementing the green concept. 2). Promote recycling activities in an effort to increase environmental awareness and reduce the use of hazardous materials in the surrounding business environment.

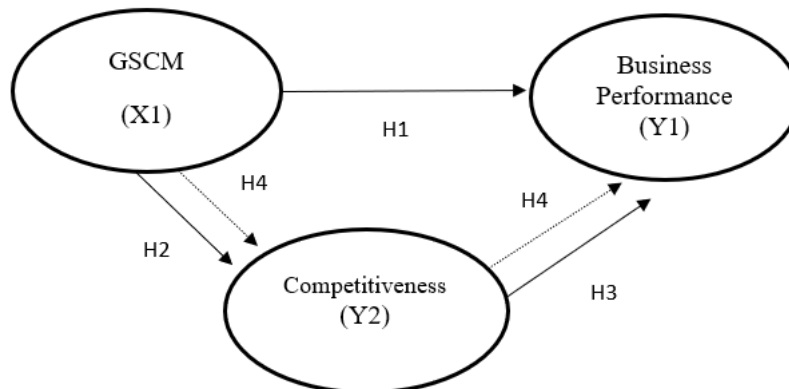
Second, green manufacturing is a production process that uses low environmental impact inputs, is very efficient and minimizes the amount of waste or pollution. Activities in green manufacturing include: 1). Hazardous substance control, water quality maintenance and input quality control before processing. 2). Energy efficiency technology, namely by reducing the consumption power in the product, increasing the product life span to increase productivity efficiency, increasing machine capacity, product design, and others.

Third, green distribution, namely activities in producing green packaging and green logistics (Ninlawan, 2010). Green packaging includes saving packaging, using environmentally friendly materials, working with vendors to standardize packaging, and taking time to unpack and promote recycling programs. Green logistics, including direct delivery to site users, use of alternative fuel vehicles, and distributing products in large batches. Fourth, reverse logistics is the process of retrieving products from final consumers

for the purpose of proper disposal and to increase value. The activities carried out by reverse logistics include collection, combined inspection, selection, sorting, recovery, redistribution, and disposal.

According to Sudiarta (2014), performance is a management activity and shows a picture of the extent to which the results that have been achieved within a certain period are measured based on comparisons with the desired standard. According to Nuvriasari (2015), business performance can be measured from several indicators, namely company profits, production capacity, and sales volume. Competitiveness can be improved and created through the application of the right competitive strategy, namely by managing resources effectively and efficiently, and must be adapted to all activities of a company function, so that later the creation of company performance is expected to produce even more value (Nuvriasari, 2015). According to Susilo (2010), competitiveness can be measured by several indicators, namely human resources, product innovation, and market access.

In previous research, research conducted by stated that green supply chain management has a positive effect on business performance. Sharabati (2021) states that green supply chain management has a positive effect on competitiveness. Nuraini, S.S. & Halim (2021) stated that competitiveness has a positive effect on company performance. And according to Jumady, E. & Fajriah (2020) green supply chain management has a positive and significant effect on company performance mediated by competitiveness. So that I can formulate the framework model as follows:



**Figure 1.** Research Framework

Through the implementation of good green supply chain management, the owner hopes to see an increase in business performance and competitiveness in Sanan tempe chip SMEs. The better the implementation of green supply chain management, the better business performance and competitiveness will follow the progress of implementation of green supply chain management. Therefore, the proposed hypothesis is:

- H1:** Green supply chain management has a significant positive effect on the business performance of the chips SMEs in Malang City.
- H2:** Green supply chain management has a significant positive effect on the competitiveness of chips SMEs in Malang City.
- H3:** Competitiveness has a significant positive effect on the business performance of chips SMEs in Malang City.
- H4:** Green supply chain management has a significant positive effect on business performance mediated by the competitiveness of chips SMEs in Malang City.

## RESEARCH METHODS

The type of research used in this research is explanatory research. The research location chosen by the researchers was the Sanan tempe chips UMKM, Purwantoro Village, Blimbing District, Malang City. The population in this study are business owners who have been in business for 2 years. The sample in this study involved all owners of the Sanan Tempe chips SMEs in the RT 14, RT 15, and RT 16 areas who had worked and produced tempe chips for two years, amounting to 72 SMEs. The sampling technique in this research uses non-probability sampling with the total sampling method (census). This type of research uses quantitative data. Sources of data in this study used primary data obtained through questionnaires. Measurement data was used in assessing the questionnaire by using a rating with a Likert scale. The data analysis technique used is using Structural Equation Model (SEM) based on Partial Least Square (PLS) processed using SmartPLS 3.0 software.

## RESULTS AND DISCUSSION

The validity indicator is seen from the factor loading value (outer loadings). A factor loading value above 0.7 can be said to be valid if the higher the correlation, the better the level of validity, which means that the indicator can be said to be valid as an indicator that measures constructs. The results of the outer loadings can be seen in table 2.

**Table 1.** Characteristics of Respondents

Information	Items	Respondents	Percentage
Gender	Male	38	53%
	Female	34	47%
Tenure	1-5 years	6	9%
	6-10 years	24	33%
	11-15 years	19	26%
	>16 years	23	32%

**Table 2.** Outer Loading Results

Latent Variable		Reflective Indicator	<i>Outer Loadings</i>	Explanation
Green Supply Chain Management	Green Procurement (GP)	GP 1	0.774	Valid
		GP 2	0.789	Valid
		GP 3	0.738	Valid
	Green Manufacturing (GM)	GM 1	0.783	Valid
		GM 2	0.835	Valid
		GM 3	0.765	Valid
		GM 4	0.826	Valid
	Green Distribution (GD)	GD 1	0.766	Valid
		GD 2	0.796	Valid
		GD 3	0.784	Valid
		GD 4	0.730	Valid
	Reverse Logistics (RL)	RL 1	0.773	Valid
RL 2		0.707	Valid	
RL 3		0.832	Valid	
RL 4		0.775	Valid	
Business Performance	Company Advantage (CA)	CA 1	0.703	Valid
	Production Capacity (PC)	PC 1	0.876	Valid
		PC 2	0.786	Valid

Competitiveness	Sales Volume (SV)	SV1	0.765	Valid
	Human Resources (HR)	HR1	0.747	Valid
	Product Innovation (PI)	PI 1	0.807	Valid
	Market Access (MA)	MA1	0.890	Valid

Based on the table above, it can be explained that all indicators on all variables show results of more than  $> 0.7$  or above 0.7, then all indicators in the table can be declared valid. The construct reliability test was measured based on 2 criteria, namely: Cronbach's Alpha and Composite Reliability. Composite reliability is used to measure the internal consistency of each variable with a value of  $>0.7$ . Meanwhile, Cronbach's alpha is used to measure the reliability of all the indicators in the model. The results of construct reliability can be seen in table 3.

**Table 3.** Construct Reliability Results

Variable	Value of Composite Reliability	Cronbach's Alpha Value	Explanation
<i>Green Supply Chain Management</i> ( $X_1$ )	0.958	0.954	Reliable
Business Performance ( $Y_1$ )	0.864	0.769	Reliable
Competitiveness ( $Y_2$ )	0.857	0.749	Reliable

Based on the table above, it can be explained that all indicators on all variables have a value of more than  $> 0.7$ , it can be stated that all variables from the composite reliability value and Cronbach's alpha can be said to be reliable. The value of variance extracted (AVE) is used to determine the validity of the convergence. The average extract variance can be said to be valid if the value obtained is  $>0.5$ . The value of convergent validity is good if the value is  $> 0.5$  (Yamin & Kurniawan, 2011). The results of the extracted variance can be seen in table 3.

**Table 4.** Average Variance Extracted Results (AVE)

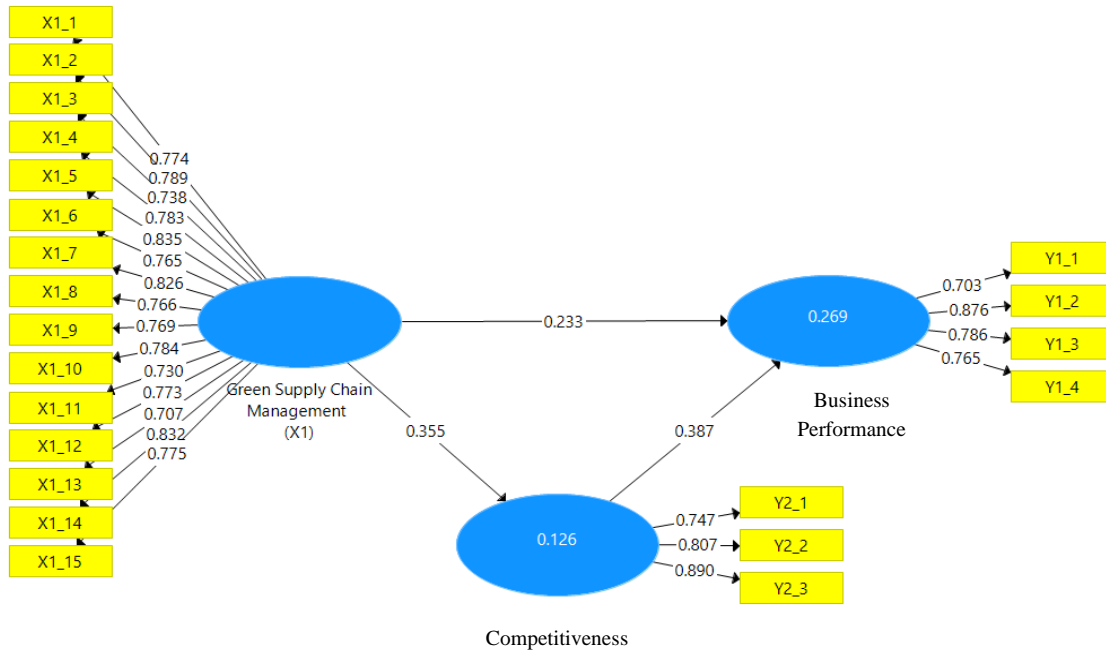
Variabel	AVE Value	Explanation
<i>Green Supply Chain Management</i> ( $X_1$ )	0.604	Valid
Business Performance ( $Y_1$ )	0.616	Valid
Competitiveness ( $Y_2$ )	0.667	Valid

Based on the table above, it can be explained that if all variables get a value  $> 0.5$ , then all variables can be said to be valid and these variables have good convergent validity. The Goodness of Fit Model (GoF) serves to determine the magnitude of the contribution of exogenous variables to endogenous variables. The results of the Goodness of Fit can be seen in table 5.

**Table 5.** Goodness of Fit Model Results

Variable	<i>R-Square</i>
Business Performance ( $Y_1$ )	0.126
Competitiveness ( $Y_2$ )	0.269

Based on the table above, it can be explained that the results of the calculation of the value of Q-Square ( $Q^2$ ) get a value of 0.361 or 36.1%, meaning that the model has a relevant predictive value and is able to explain research data information of 36.1%. The research structural model shows the relationship of each indicator with the variables. The goal is to determine the nature of the indicators of each latent variable. The structural model can be seen in Figure 2.



**Figure 2.** Structural Model of Research

The direct effect hypothesis test has the aim of knowing whether there is a direct effect of exogenous variables on endogenous variables with the criteria of t-statistic value  $>$  t-table.

**Table 6.** Direct Effect Hypothesis Results

Hypothesis	Original Sampel	Standar Deviation	T Statistics	P Values	Explanation
GSCM ( $X_1$ ) $\rightarrow$ Business Performance	0.233	0.117	1.996	0.0465	Significant
GSCM ( $X_1$ ) $\rightarrow$ Competitiveness	0.355	0.078	4.572	0.0000	Significant
Competitiveness $\rightarrow$ Business Performance	0.387	0.121	3.199	0.0015	Significant

Based on the table above, information can be obtained regarding the results of each direct effect hypothesis test that has been carried out, the result of direct effect was green supply chain management on business performance as a significant positive effect. Because the t-statistic value in the direct influence hypothesis test has a value greater than  $>$  t-table, which is 1.996 and a significant level of 0.0465 while the coefficient level gets a positive number value of 0.233. This shows that green supply chain management has a significant influence on business performance. In the analysis that has been carried out by researchers,



the first hypothesis about the effect of green supply chain management on business performance can be obtained with significant positive results. As it can be seen from the significant level and coefficient in this study, it shows that the green supply chain management variable has a positive and significant effect on business performance. Therefore, the better the green supply chain management, the higher the level of business performance for the Tempe Chips SMEs in Sanan. The results of this study are in line with the research of Habib (2021), which states that green supply chain management can affect business performance positively and significantly. Based on observations in the field, the implementation of green supply chain management on the business performance of tempe chip SMEs in Sanan has been very well implemented. The example given is that the supplier of tempe chips in Sanan already has an environmental quality standard certification, namely ISO 9001. According to Adianto & Gultom (2020), ISO 9001 is a procedure for collecting, analyzing, and reporting data in the form of product or service quality within the organization to build trust and customer satisfaction effectively. In addition, the tempe chip SMEs in Sanan have used energy-efficient/energy-saving technology. According to Ninlawan (2010), energy efficiency technology is a technology that serves to reduce consumption power in products, increase product life mass to increase efficiency and productivity, as well as develop product design, machine capacity, and others. Based on the results of this study, it can be concluded that green supply chain management has a positive and significant effect on business performance.

Green supply chain management on competitiveness has a significant positive effect. Because the t-statistic value in the direct influence hypothesis test has a value greater than  $> t$ -table which is 4.572 and a significant level of 0.0000 while the coefficient level gets a positive number value of 0.355. This shows that green supply chain management have a significant influence on competitiveness. In the analysis that has been carried out by the researchers, the second hypothesis about the effect of green supply chain management on competitiveness can be obtained with significant positive results. As it can be seen from the value of the significant level and the coefficients in this study, the green supply chain management variable has a positive and significant effect on competitiveness. Therefore, the better the green supply chain management, the higher the level of competitiveness of the tempe chip MSMEs in Sanan. The results of this study are in line with the research of Sharabati (2021), which states that green supply chain management can affect competitiveness positively and significantly. Based on observations in the field, the implementation of green supply chain management on the competitiveness of tempe chip SMEs in Sanan has been very well implemented. The example given is the tempe chip SMEs in Sanan using environmentally friendly packaging. According to Draskovic (2014), green packaging is part of the company's efforts to attract consumers through environmentally friendly packaging. In addition, the tempe chip MSMEs in Sanan promote recycling activities to increase awareness of the use of materials that are harmful to the environment. According to Santoso & Fitriyani (2016), promoting environmental sustainability is a company management strategy that is suitable for use today in marketing its products to a wider range.

Competitiveness on business performance has a significant positive effect. Because the t-statistic value in the direct influence hypothesis test has a value greater than  $> t$ -table which is 3.199 and a significant level of 0.0015, while the coefficient level gets a positive number value of 0.387. This shows that competitiveness has a significant influence on business performance. In the analysis that has been carried out by researchers, the third hypothesis about competitiveness in business performance can be obtained with significant positive results. As it can be seen from the value of the significant level and the coefficients in this study, the competitiveness variable has a positive and significant effect on business performance.



Therefore, the higher the competitiveness, the higher the level of business performance in the Sanan tempe chip SMEs. The results of this study are in line with the research of Nuraini & Halim (2021) which states that competitiveness can affect business performance positively and significantly.

Based on the results of observations in the field, it shows that the competitiveness of the tempe chips in Sanan on business performance is very good in its application. The example given is that the marketing reach for tempe chips in Sanan is getting wider every year. There is an opportunity for mutual sharing between entrepreneurs through events, exhibitions, and festivals, which are some of the marketing options currently available to increase sales volume. In addition, the innovation carried out by the tempe chip SMEs in Sanan is very good. According to Jiménez & Sanz-Valle (2011) innovation ability has a significant effect on business performance. MSMEs can improve their performance both financially and non-financially by developing new products. Based on the results of this study, it can be concluded that competitiveness has a positive and significant effect on business performance.

The indirect effect hypothesis test involves an indirect effect between the two variables and can occur if a variable affects another variable by going through one or more latent variables with trajectories in the research model. The results of the indirect effect hypothesis test can be seen in table 7.

**Table 7.** Indirect Effect Hypothesis Results

Hypothesis	Original Sampel	<i>Standar Deviation</i>	T Statistics	P Values	Explanation
GSCM → Competitiveness → Business Performance	0.137	0.052	2.599	0.0096	Significant

Based on the table above, information can be obtained regarding the results of each indirect effect hypothesis test, the result was green supply chain management on competitiveness mediated by business performance has a significant positive effect. Because the t-statistic value in the indirect effect hypothesis test has a value greater than  $>$  t-table which is 2.599 and a significant level of 0.0096 while the coefficient level gets a positive number value of 0.137. This shows that green supply chain management has a significant influence on competitiveness mediated by business performance. In the analysis that has been carried out by researchers, the third hypothesis about competitiveness in business performance can be obtained with significant positive results. Therefore, the higher the competitiveness, the higher the level of business performance in the Sanan tempe chip SMEs. The results of this study are in line with the research of Nuraini & Halim (2021) which states that competitiveness can affect business performance positively and significantly.

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## CONCLUSION

Based on the results of the analysis and discussion of research on the effect of green supply chain management on business performance and competitiveness in MSMEs, several conclusions can be drawn as follows: 1) Green supply chain management has a significant influence on the business performance of Sanan tempe chips MSMEs. 2) Green supply chain management has a significant influence on the competitiveness of the Sanan tempe chips SMEs. 3) Competitiveness has a significant influence on the business performance of the Sanan tempe chips MSME business performance. 4) Green supply chain management has a significant influence on business performance, mediated by the competitiveness of the Sanan tempe chip SMEs.

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