

Effect of Supply Chain Innovation and Business Strategy Formulation in SME Clusters

Muhammad Farid Wajdi¹, Anton Agus Setyawan², Syamsudin³, Ihwan Susila⁴, Muzakar Isa⁵

^{1,4,5}Post Graduate School Universitas Muhammadiyah Surakarta Indonesia;

^{2,3}Department of Management, Fakultas Ekonomi dan Bisnis Universitas Muhammadiyah Surakarta Indonesia;

¹fw265@ums.ac.id

²anton.setyawan@ums.ac.id

³sya190@ums.ac.id

⁴ihwan.susila@ums.ac.id

⁵muzakar.isa@ums.ac.id

Abstract— The purpose of this study is to analyze the effects of supply chain innovation and business strategy formulation to business performance. This study analyzes supply chain innovation and how SME compile their business strategy in industrial clusters. Design of this study is quantitative. We develop a multivariate estimation model to analyze the relationship among constructs. We conduct surveys in 3 different SME clusters, they are shoes and sandals cluster in Mojokerto East Java, furniture cluster in Sukoharjo, Central Java and mushroom cluster in Yogyakarta. This survey includes 206 SME from three different clusters. Our result shows that supply chain innovation and business strategy formulation has positive effects on SME business performance. However, the result shows different magnitude on each of SME clusters. SME should improve their innovation in order to increase their business performance. Source of innovation is human capital, while empirically this is one of SME problems in Indonesia. Lack of qualified human capital encourages SME to conduct training with assistance from government and business partners. This study found that in Indonesia's SME cluster there are difference business strategies. SME clusters uses two different strategies in their business policies, they are innovation and product development based on business partner strategies.

Keywords— supply chain innovation, business strategy, SME cluster, performance.

1. Introduction

Supply chain innovation has widely known as key factors in the increasing process of economic growth and business performance [1-5]. Innovation in business process, product development, market extension and organizational development are real form of business strategic to strengthen business competitiveness [6-8]. In [9] found that innovation in human capital would

guarantee sustainable high performance in business organizations.

Various business organizations have improved their innovation strategy as mandatory step in their business plan. Business organizations view innovation should be planned and periodically evaluate to increase its effectiveness [10]. Large scale and modern business organizations could manage their innovation due to availability of resource and knowledge about business plan formulation and targeted performance [8]. However, SME (Small and Medium-Sized Enterprises) does not hold such previous knowledge. Soltesa and Gavurova found that foundation problem of innovation development in SME is lack of resource and knowledge among this business organizations [11].

Innovation embedded in business strategy is important for business organizations [7, 10]. It means that business strategy planning is mandatory for business organizations. Lofving et al., mention business strategy concept is important guide for SME business practice although it needs adjustment in the implementation process [12]. Raymond and Bergeron found that in some cases SME choose different types of business strategy, based on their market, products and resources [13].

Indonesia has developed SME clusters as part of strategy to build competitiveness among those business organizations [14]. This country needs to increase SME's contribution to economic development. Bek et al., conclude that clusters strategy in SME development is important to overcome problem of resource constraints in this business organization. SME cluster is one form of business network. In [15] reveal local government should encourage SME clusters to strengthen their competitiveness and economic growth. In [16] found that lack of studies about SME clusters and competitiveness in developing countries. Therefore,

studies in the area should be developed with various settings and models.

This study objective is to analyze the role of innovation and business strategy formulation in improving SME performance. It also explains innovation development among SME's in certain industries. Business strategy formulation has never been a consideration for Indonesia's SME in their business practice or at least these business organizations assume that business strategy only important in certain conditions, such as decreased of sales, developed new market etc. Most of SME's in Indonesia, especially micro business still struggle for survive in the competition, this is the reason their business strategy formulation is not become priority policy [17].

This study analyzes three different SME clusters in Indonesia, they are furniture SME cluster in Sukoharjo, Central Java, mushroom farms SME cluster in Jogjakarta and footwear SME cluster in Mojokerto East Java. These three SME clusters have different characteristics in their products, market, location and resources. We decide to analyze these SME clusters to gain variation in our data related with innovativeness and business strategy formulation. We develop multivariate statistic model to assess the effect of supply chain innovation and business strategy formulation on SME performance. We conduct survey which involves 206 respondents of SME owners and managers in those three different clusters.

Recent advances in information technology have significantly changed the business climate of companies. To achieve today's highly volatile market target, organizations need to have a dynamic, collaborative network management chain. Medium and small companies are among the industries that face a lack of resources and proper orientation in the field of supply chain coordination. Because most active managers and small and medium-sized companies have enough experience, with the advent of e-commerce and entry into global markets, this will help managers address the major challenges in the supply chain to the fullest. Efficiency and flexibility, which are the main goals of e-commerce, can be achieved. Also, with an efficient supply chain, it can be expected that the organization will be able to achieve an effective competitive advantage in dealing with today's competitive world. In this article, we first mention a brief history of e-commerce and supply chain management in SMEs, and then examine and analyze the role of e-commerce in supply chain management, and finally suggest suggestions for improving the competitive advantage of We deal with the effective supply chain through e-commerce support.

2. Literature Review

2.1 SME Supply Chain Innovation and Performance

SME have known as business organizations with limited resources and struggling to survive in the competition. This condition makes SME do not consider innovation as an option in their business practice. Soltesa and Gavurova propose several symptoms of insufficient innovation development in business and industries. They are: applying non-systemic tools, government limited support to establish industrial zones, outdated and underdeveloped infrastructure for innovation, lack of research and development result offer and lack of risk capital [11].

Innovation in SME related with an effort to extend business performance. Prajogo explores the relationship between innovation and business performance in manufacturing and service industries. The result shows that innovation has strong relationship with business performance in manufacturing industries. Other important information from the study is company should focus on process innovation instead of product innovation [7]. In [18] in their study of SME in Eastern Europe also found that marketing innovation could help improved business performance, especially the one related with digitalization of marketing process. These findings could be important concepts in SME business practice. In Indonesia, SME in manufacturing have large contribution to economic development. It related with the nature of SME manufacturing which considered labor intention industry [19]. In our study, we assume that level innovation has strong relationship with business performance.

In [18], the effect of public supply chain relationships on the competitiveness of nomadic and medium-sized automotive parts companies in Iran was investigated. The structural interpretive model of research, which is based on the opinions of experts, shows that the general sense of security and safety is at the highest level of the model, ie the first level. The analysis of the formulated path shows that the effect of this general on the competitiveness of companies is the effect of 86% is confirmed. A sense of security and safety has been identified as influenced by its lower-level factors, namely, 7 factors: trust, commitment, adaptability, cooperation, integrity, contract, and information exchange; However, the data from the status of the companies under study show that only the two generalities of compliance and contract are effective in creating a sense of security and safety of the companies and the extent of the impact of

other people is not confirmed. Of the two generals, the highest impact on the general contract is 88%

H1 supply chain innovation in SME has positive effect to business performance.

2.2 Business Strategy Formulation and Targeted Performance

Business strategy formulation is guidance for running company's business process. Srimuk and Choibamroong discover business strategy for SME could help increase efficiency in their investment [20]. In Indonesia case, business strategy formulation helps SME to convince banking in their risk assessment [21]. SME and micro business have problems in accessing resource from third party, for example: many SMEs in developing countries have adversity to earn loan from financial institution. Wajdi et al., reveal that this problem occurs due to two difficulties. They are collateral issues and SME inability to write business prospective documents [17]. Those difficulties related with risk attitude among SME. Business strategy contains of two kinds of strategic plan, they are: targeted performance (i.e sales growth, profit growth, revenue etc.) and risk assessment [22].

Business strategy for SME contains of several targeted performance and the procedure to achieve it. In many cases, SME arranges their business strategy based on intuition instead of construct it in a document. SME usually has small business scale that it consider flexible for changes. However, Raymond and Bergeron argue business strategy formulation is important when business organization has flexibility in their business process [13].

H2 Business strategy formulation in SME has positive effect on their business performance.

3. Research Methods

3.1 Population and Sample: SME Clusters in Manufacturing and Agriculture

Local government in Indonesia has developed many SME clusters with different types of business. However, Sembiring emphasizes SME in manufacturing and agriculture are important since these two kinds of industries reflect the economic structure of Indonesia. We choose three SME clusters in manufacturing and agriculture in Java which includes SME cluster with best practice in their business processes by Bank Indonesia in 2012-2014. They are furniture SME cluster in Sukoharjo, Central Java, mushroom farms SME cluster in Jogjakarta and footwear SME cluster in Mojokerto East Java. There are more than 300 SME in Trangsan, 40 SME mushroom SME in Yogyakarta and more than 250 shoes and sandals SME in Mojokerto [19].

We apply purposive sampling method in sampling methods. Selected characteristics of our respondents are they should be more than 3 years in business, appropriate profit and those SME has business network. In this survey, we found 89 SME as respondents from Trangsan, 93 SME from Mojokerto and 24 mushrooms SME from Yogyakarta. In total we obtain 206 respondents as observations of this study.

3.2 Measurement

We developed measurement for supply chain innovation, business strategy formulation and business performance from Thacker and Handscombe, Bek et al., and Prajogo [7, 15, 23]:

1. Supply chain innovation is company experience in conducting new strategy in promotion, exploring new buyer, exploring new supplier and exploring new distribution measured with likert scale.
2. Business strategy formulation is the ability of constructing business plan measured with rating scale.
3. Business performance is percentage of SME profitability in the last 3 years.

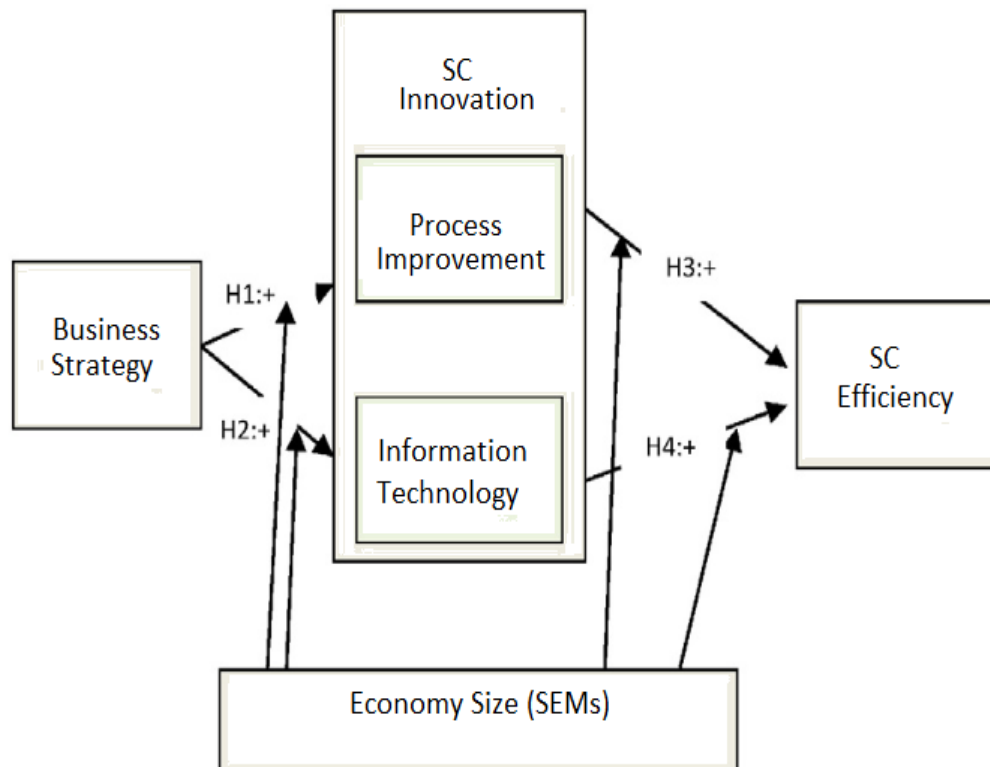


Figure 1: proposed structure for business strategy

4. Results and Discussions

4.1 Rattan Furniture SME Cluster

With the expansion of globalization of markets, the only way for companies and organizations to survive depends on increasing competitiveness and gaining and maintaining a sustainable competitive advantage. To achieve supply chain competitiveness, customer service must be at the forefront of activities. Today, competition between individual companies has given way to competition between supply chains. Supply chains connect suppliers to a manufacturing company and the company to its customers. Proper supply chain management requires us to ensure high customer service, low costs and short cycle times. Today, the cost-effective solution is not necessarily the volume of products and the economic scale, but the supply chain management.

The Rattan cluster lies on two villages of Kartasura District, Trangsan and Gatak, in Sukoharjo Regency. They are mature stage clusters with 92 entrepreneurs who make an integrated production process, produce main products such as tables, chairs, and other furniture. There are also

handicraft byproducts combined with nonfurniture raw materials.

Not all entrepreneurs complete the business legality. Of the entrepreneurs only 26% have legality including Trading Company, Commanding Company (CC), and Ltd. There are 76% of individual companies or can be said to have no legality and official business license. Enterprises in the rattan cluster have been started since 1951. Firms over 10 years old are second generation family firms. 52% of firms have been in business within 2 to 15 years, 36% firms are within 16 to 30 years. There are only 12% firms over the age of 31 years.

The working capital per year in every business varies greatly, reflected in the large scale of production. 75% of firms need capital per year less than 50 million rupiah, while 17% of companies require capital per year between 60 to 100 million. There are only 8% of firms that require capital per year more than 110 million rupiah. Capital required for the production process is obtained from own capital or loans from banks and other financial institutions. The employment of rattan clusters is 886 workers, including 147 family workers and 639 non-family workers. As many as 40% of workers

come from Trangsan and Gatak villages, while 60% come from outside the region. The value of 2015 transactions in this cluster reached Rp 240 billion, and then increased 11% or Rp 270 billion in 2016. In 2017 the transaction value reached Rp 359 billion, an increase of 25% from the previous year. The total transaction value within the timeframe reaches Rp 869 billion.

4.2 Footwear SME Cluster

There are 93 business units in footwear clusters that produce shoes, sandals, and partial parts of footwear. This cluster is located in Mojokerto Regency, exactly in Karang Kedawang, Japan, and Jampirogo Village, Sooka District, East Java Province. This business started in 1981 by local businessmen.

The number of firms that have not completed the business license and legality is huge. 97% of firms are individual businesses without business legality, in other words there are only 3% firms that have the legality of a Trading Company. In 1951 the footwear business was started by 3 craftsmen who then continued to grow to hundreds. There are 10% of entrepreneurs who run this business for over 31 years. A larger number or about 38% are entrepreneurs operating within a period of 16 to 30 years. The most common on footwear clusters are entrepreneurs who operate less than 15 years, by 52%.

The capital required for the footwear manufacturing process varies greatly depending on the type and quality of the product. More than half of the artisans, exactly 55% require capital of less than Rp 50 million per year. There are 18% of entrepreneurs who require capital of between Rp 51 million to 100 million per year. There are 6% of entrepreneurs who need capital between Rp 101 million to 150 million per year. As many as 12% of entrepreneurs require capital in the range of Rp 151

million to 200 million per year. The rest, 9% of entrepreneurs need capital more than 200 million per year. Source of capital obtained from own capital and bank loans.

Almost all footwear craftsmen are the original workforce of Mojokerto. With a large enough dominance, or as much as 96% of the total craftsmen are Mojokerto people. Based on the survey there are only 4% of craftsmen in footwear clusters coming from outside Mojokerto. A small number of footwear craftsmen come from Yogyakarta.

4.3 Mushroom SME Cluster

There are 92% of licensed firms, and 8% firms are unlicensed from the entire firms. Of all firms, 92% of individual companies dominate, there are only 4% Trading Company and Limited Company, and none of the Commanding Company.

None of the firms have been running for more than 15 years. At most, 42% firms are 0-5 years old, and 33% are aged 6-10 years. A quarter of the total, or 25%, is a firm aged 11-15 years. Few firms allocate annual capital more than Rp 50,000,000, - or only 2%, because the most are firms with annual capital of Rp 26,000,000 - 50,000,000. There are 29% firms that allocate less than Rp 10,000,000 per year. Not much different, 25% of firms that allocate Rp 11,000,000 - 25,000,000.

Most firms have a labor force of 5-10 persons, quite dominant with 71% of the total mushroom firms. In this cluster there are only 8% and 4% respectively for firms with a workforce of 11-20 and more than 20 persons. There are 17% mushroom firms with a workforce of less than 5 persons.

Table 1 shows the result of validity and reliability of the measurement.

Table 1. Summary of Validity and Reliability Test

Variables and Indicators	Cronbach Alpha	Validity	
		1	2
Supply chain innovation	0.8525		
1. Develop new promotion strategy.		0.658	
2. Expand new buyers		0.920	
3. Elaborate cooperation with new suppliers.		0.850	
4. Develop new methods of distribution		0.883	
5. New product development.	0.648		
Business Strategy Formulation	0.9101		
1. Evaluating business result			0.880
2. Setting up target achievement.			0.935
3. Developing working plan.			0.937

Table 2 shows the result of model estimation in this study

Table 2. Regression Result Summary

Independent Variables	Standardized Regression Coefficients
Supply chain innovation	0.432**
Business Strategy Formulation	0.250**

F Stat = 20.415**

R² = 0.312

Notes:

** = significant at level of confidence 0.01

Our model of estimation shows that supply chain innovation and business strategy formulation has positive significant effect to business performance of SME. Both independent variables are significant at level of significance 0.01. We conclude that the hypotheses of this study are all supported. Table 3 shows the conclusion of hypotheses testing in this study.

Table 3. Hypotheses Testing Results

Hypotheses	Conclusion
H1 Supply chain innovation in SME has positive effect to business performance	Supported
H2 Business strategy formulation in SME has positive effect on their business performance	Supported

Since one of the main concerns of manufacturing companies is always to achieve more market share and according to existing studies, this is achieved by having coordination and cooperation in the

entire supply chain and thus achieving competitive capabilities such as innovation. On time, product quality and lower cost, etc. can be achieved. Today, corporate environments are sensitive, productive, and competitive. Increasing financial performance depends largely on the type of relationship between the company's two pillars, supply chain management and customers, and a company with better integration can better achieve its goal. Create the necessary productivity; And improve their financial performance, so the way each manager acts and behaves in a work environment depends on the interaction between the manager's personality and the company's environmental conditions. In the current competitive market, economic and manufacturing firms, in addition to paying attention to the company and domestic resources, have committed themselves to managing and monitoring related resources and elements outside the company.

Our model has moderate goodness of fit with F statistic 20.415 significant at level of significance 0.01 and R² or coefficient determination 0.312. We consider with low coefficient determination our model needs explanation. It shows that supply chain innovation and business strategy formulation explains little part in increasing business performance. Our model describes condition of

supply chain innovation and business strategy formulation in three SME clusters of this study.

This model has supported Prajogo findings that supply chain innovation has positive effect on business performance in SME clusters [25]. Our model also supports Thacker and Handscombe findings on the relationship of SME innovation in strengthen competitive positions and performance [23]. The role of business strategy in increasing business performance of SME is supported by the result of this study. This finding is similar with Srimuk and Choibamroong findings of SME strategy to compiling detail business plan to ensure their business performance achievement [24].

4.4 Restricted Supply Chain Innovation in SME Clusters

There are two SME clusters in manufacturing in this study, they are rattan furniture in Trangsan Sukoharjo, Central Java and shoes and sandal in Mojokerto, East Java. Rattan furniture SME cluster in Sukoharjo, Central Java is one of the center of rattan industries in Indonesia. In this SME cluster there are 3 groups of rattan furniture manufacturers with different supply chain innovation:

1. Craftsman. This group of manufacturers is pure craftsman which includes in micro entrepreneur. In this rattan manufacturer, employee of the company is immediate family. They accept sub contract manufacturing from wholesaler or exporter. This kind of manufacturer dominates Trangsan rattan manufacturer clusters.
2. Craftsman and wholesaler. This group of rattan manufacturer has minimum ability to give sub contract job to craftsman. They transfer their order whenever they capacity is already full. However, their market is limited to local or national.
3. Exporters. This group of manufacturers has direct access to local, national and also global market of rattan furniture.

Exporters are manufacturer who pioneered supply chain innovation since this SME has enough resources. Rattan exporter has expert in product design and they also has market analyst. However, rattan exporter also still has similar characteristic with SME generally, they play dual role as owner and manager. In this case, owner usually also become product designer and marketing manager. Hence, SME owner in rattan SME cluster is also innovator with strong financial and technological supports. Their innovation includes product design, market extension and process business.

Wholesalers and craftsmen were also innovators. However, they have limited supply chain innovation in product design. This problem occurs due to limited resource owned by those SMEs. Wholesaler and craftsmen has competence in product design but they have limited financial support.

Shoes and sandals SME cluster in Mojokerto has different characteristic. There are two kinds of shoes and sandals manufacturers:

1. Shoes and sandals craftsman. This type of business dominates shoes and sandals cluster in Mojokerto. Most of it has members of family as employee and they production process based on sub contract job from national or multinational manufacturers. They have obligation to deliver all of their output to their sub-cons partners (i.e national or multinational manufacturer). However, they are few sub-cons partners who give choice to craftsman of selling their reject product to local market.
2. National and multinational shoes and sandals manufacturer. This type of manufacturer plays important role as supplier, manufacturer and wholesaler for the industry. In fact, they existence have an impact to market sustainability of shoes and sandals cluster in Mojokerto. The most important role of national and manufacturer is they function as a sub-cons partner to every craftsman in the cluster.

Shoes and sandals SME cluster play roles as sub contract for multinational and national shoes manufacturers. They do not have opportunity to create supply chain innovation since product design and market policy controlled by large manufacturers. Their innovation is limited in creating efficient process business to shortened delivery time.

Mushroom SME cluster in Jogjakarta belongs to agriculture industry; however this cluster based on product supply chain innovation as core of the business. Farmers in this SME cluster hold a significant role since they hold cultivation technology of mushroom. Their innovation in developing different types of seed is the most valuable chain in the industry.

4.5 SME Business Strategy and Risk Attitudes

Business strategy formulation for our respondents in those three SME clusters is limited for daily business practice. There is lack document on business planning and evaluation of performance. Rattan SME exporters are one of business organizations that aware of the importance of

business planning. Their awareness occurs due to experience in compiling business prospective and risk analysis document for financial institutions. Most of rattan furniture exporters are bankable and they have to arrange their investment strategy carefully. For this SME, business strategy is important.

Craftsmen are dominant respondents in this study. These types of SMEs put business strategy formulation as second or third priorities in their business practice. Types of business strategy formulation for craftsmen are decisions about product design, raw material supply and efficiency in production process. SME is very limited in conducting risk assessment as a part of business strategy. They consider that business risk is uncontrollable factor in business. This perception result limited business risk mitigation among SME in these clusters. Farmers in mushroom SME clusters do not compile their business strategy precisely. They perception of business strategy formulation is related with daily decision in developing mushroom seeds.

5. Conclusions and Implications of the Study

In this study, supply chain innovation has important role to achieve excellent business performance in SME clusters of manufacturing and agriculture industries. This study shows that supply chain innovation in agriculture SME cluster higher than manufacturers. This finding is different with Prajogo findings that SME in manufacturing has higher innovation in business process than agriculture. This difference occurs due to the role of production technology. Our respondents, SME in manufacturing have limited innovation since they do not control the whole business process. Most of our respondents are craftsmen which working in a sub cons business relationship. In mushroom SME cluster farmers always intensify innovation since in the key of business process is the development of mushroom seeds. Farmers control the development of mushroom seeds in this cluster [7].

Business strategy formulation shows to be a key role in increasing business performance of SME. In this study, business strategy formulation has been an important procedure for rattan SME exporters. They have to compile business strategy formulation in order to anticipate uncertainty in their business. This uncertainty includes price of raw material, demand of product and regulation. For craftsmen and farmers in SME clusters, business strategy related with daily business decision. They do not construct long term planning for their business.

In [26] study on SME supply chain innovation in cluster conclude that study of SME in developing countries is limited. This study may fill the gap of SME innovation studies in developing countries. This study also gives different perspective about supply chain innovation in SME clusters [16]. This study strengthen Prajogo finding about supply chain innovation in agriculture SME, compare to manufacturers [7].

Practical implications of this study are; SME owner or manager should develop their innovation in their business. Types of innovations in SME include product development and market extensions. Problems of limited resources in SME could be overcome by strengthen their business network by using SME clusters. In this cluster they could develop resource sharing among SMEs with business process similarity. SME manager and owner should elaborate business strategy to anticipate uncertainty in their business. Business strategy formulation is also important in creating sustainable business performance.

Our model estimation failed to capture the differences of supply chain innovation in different SME clusters. Research in SME supply chain innovation in the future should includes different characteristic of SME clusters in the model estimation. Our composition of respondents is not sufficient to explain the different characteristics of exporters, craftsmen, wholesaler and farmers. In the future, researcher in this area of study should consider the composition of respondents with different roles in SME clusters.

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