Analysis of Customer Shopping Behavior and Forecasting Raw Materials in Making Product Sales Strategies for MSMEs

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Abstract— **A sales strategy is made to support the development of a business by looking at customer segmentation, forecasting results as well as opportunities and conditions of the business. One of UMKM in Cibodas Jasa has continued to experience a decline in sales since February. In addition, due to small sales, there is a buildup of raw materials and causes damage to raw materials stored, especially in raw materials for making fruit salads. This study has the aim of analyzing customer segmentation and forecasting as a basis in making the sales strategy. The k-means clustering algorithm method is used to segment customer based on value so that recency, frequency, and monetary (RFM) data are needed. While the forecasting process is done by comparing the simple exponential smoothing and ARIMA methods. The strategy-making process is carried out by looking at the opportunities, threats, strengths, and weaknesses that are owned based on the results of data processing, observation of business conditions, and also environmental prospects using SWOT analysis. The results of data processing show Chungky Monkey have 3 types of customer segments and is predicted to increase sales in the next 2 weeks. Based on the processing results, the target customer is a one-time buyer with a prediction of selling 55 fruit salad boxes and 3 practical strategies are produced from a SWOT analysis whose application considers the opportunities and strengths of the merchant.**

***Keywords*— Customer Segmentation, Forecasting, Clustering, Simple exponential smoothing, ARIMA, SWOT Analysis**

I. INTRODUCTION

According to data from the Ministry of Cooperatives and SMEs in Jakarta, there are 37,000 Micro, Small, and Medium Enterprises (MSMEs) that have felt the impact of the Covid-19 pandemic. Whereas many as 56% of all MSMEs reported decreased sales. The decline in sales could be due to the implementation of the PSBB policy or what is now known as PPKM [1]. On the other hand, GrabFood noted that there were more than 150,000 new partners who joined the GrabFood service [2]. According to research by the Demographic Institute, Faculty of Economics and Business, University of Indonesia, as many as 94% of MSMEs have switched to digital businesses. With the competition in the digital ecosystem getting bigger, a strategy is needed to be able to increase sales. Likewise, Chungky Monkey, who is one of the food and beverage sales partners at GrabFood, feels the competition is so great in the online sales channel through the delivery service application.

The sales performance of Chungky Monkey continued to increase from November 2020 there were 60 orders to 99 orders in December 2020 and 167 orders in January 2021. However, there was a decrease in sales in February 2021 by 24.55% and only received 126 orders per month compared to January 2021 as be seen in Fig. 1. In addition, there was a decrease in gross profit received starting from February 2021 by 26.33% from January 2021 and continued to decline in March 2021. In fact, if look at the sales comparison in January 2021, there is an increase in orders of 68.69% compared to December 2020.

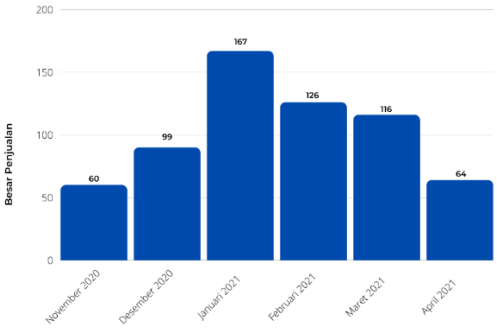

Fig. 1 Chunky Monkey orders every month.

Wherefrom December 2020 to March 2021, discounts are carried out regularly for 5 times so that it is hoped that there will also be an increase in February 2021 and March 2021. Unfortunately, the decision promotion strategy is not done in any consideration. In the online food services promotion, there are minimum sales that vary from Rp. 30,000 to Rp. 100,000 to get the promo. In determining the promo carried out in February 2021, the selection of minimum sales is only seen from the average nominal purchase in January 2021, which is Rp. 63,000. If you look at it, there is a large difference between the largest transaction nominal and the smallest transaction nominal, namely Rp. 134,500 and Rp. 13,000. After checking, orders that have a nominal price with a range between Rp. 60,000 to Rp. 70,000 only 21 orders out of 134 orders.

Therefore, MSMEs want to know the types of customers they have served so far so that the promos provided will be right on target with the ability of their customers with a method that can see the potential customers they have. This study also forecasts the need for fruit for making salads. Forecasting is done to solve the problem of discarded fruit because it is bought too much compared to sales so that it is stored for too long and is damaged. By doing market segmentation, it is hoped that promotion will be more efficient and also with the help of forecasting can reduce losses from the disposal of fruit raw materials.

Based on these two problems, an analysis of customer characteristics was carried out using k-means clustering. The use of the clustering method is carried out to determine the form of a grouping of MSMEs transaction data where the data does not yet have its own data classification. As well as a prediction process for the sale of fruit salad because the product that provides losses due to damage due to long storage is the raw material for fruits. The prediction process is carried out using simple exponential smoothing and ARIMA because the forecasting is carried out in a short period of time and the data held is not affected by an increasing trend or decrease.

II. Literature Review

A. Customer Behavior

Consumer behavior is a form of study of the customer buying process such as the process of choosing, consumption patterns including responses, and emotions when making purchases [3]. Analysis of customer behavior can help sellers determine the form of product presentation that will produce a maximum impact on consumers by studying buying patterns and customer trends. Customer behavior can be affected by 4 factors, namely [4] :

1. Personal factors, regarding customer interests and responses that can be influenced by demographics such as age, gender, economy, or lifestyle.
2. Psychological factors, regarding customer responses to a product, brand, or marketing that are influenced by perspectives and attitudes or personal beliefs/motivations.
3. Social factors, regarding family, friends, education level, and social media.
4. Cultural factors, such as social class, culture, or family traditions.

B. Customer Segmentation

Customer segmentation or market segmentation is the division of potential customers within a market scope into separate groups. Customer grouping is done by looking at the shopping needs and behavior of a group of customers [5]. In the customer segmentation process, an analysis of similar patterns in customer data will be carried out and will become the same cluster. segmentation will help companies to get to know their customers more closely, such as knowing what they actually buy or what is the driver of increasing purchasing power and finding targets in a promotion to increase their income. In the segment, 3 approaches can be used in dividing customer segments [6] :

1. Apriori segmentation, is usually used to classify based on the characteristics provided in general in making customer segments. The use of a priori is not flexible because there is a possibility that the basis of the size of the company is different.
2. Needs-based segmentation, is based on a need or a driver conveyed by customers towards certain services or products offered.
3. Segmentation by value, Segmentation based on value will reach more financial aspects, the use of this segmentation will segment customers who have the same value characteristics. This segmentation will look at the usage rate from customers which can be used as a predictive indicator of loyalty.

C. Clustering

Clustering is a method used to make data grouping. The grouping is done into several clusters and each cluster has similar characteristics between the data [7]. Clustering is generally used as an unsupervised learning method. The purpose of using the clustering method is to find a new set of categories or clusters of data [8]. Therefore, clustering is usually used on data that does not yet have a fixed cluster or group. One type of clustering algorithm is the K-Means algorithm which is used to find and recognize patterns in data [9]. This algorithm aims to perform an optimal search based on data criteria in determining the number of appropriate groupings for the data. To determine the optimal number of clusters with K-Means, it can be approached using the elbow method. This approach can produce a range of k values by looking at the elbow point on the graph. The Elbow point is a distortion point where there is a significant decrease in the graph elbow method such as in fig. 1.

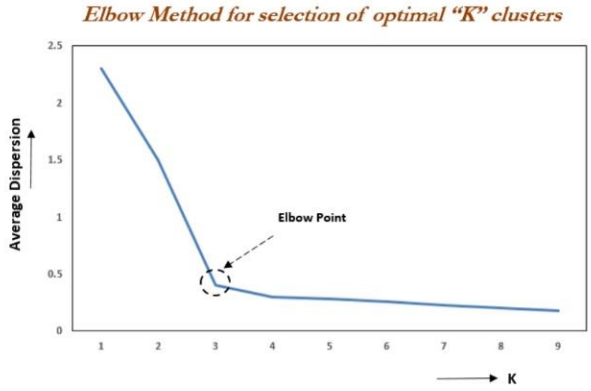

Fig. 2 *Elbow* Graph (Dangeti, 2010)

In evaluating the quality of cluster division using k-means on the data, it can be done by using silhouette values. The range of silhouette values is between -1 and +1. Silhouette value is

calculated based on how similar a data point is to its own cluster (cohesion) and compared to other clusters (separation). Determination of a quality cluster if it has a higher silhouette value than other types of N-cluster division. If the resulting silhouette value is negative, data sharing or creating clusters is too much or too little [10].

D. RFM Method

The RFM method or RFM index is one method that is often used to analyze customer characteristics based on their purchase history. RFM became very popular due to the use of numerical scales that are objective and informative about customers, RFM is also very simple and intuitive which is easy to interpret and understand [11]. RFM is a segmentation technique that analyzes 3 factors, namely Recency, Frequency, and Monetary. The following is a discussion of these factors [12]:

1. Recency, will relate to the length of time since the last activity of the customer such as the last visit, last application use. Recency will determine the level of responsiveness of customers to a particular marketing or brand. The form of the data in the form of the amount of time since the last transaction can be in the form of months, weeks, and even hours.
2. Frequency, is how often customers visit or make purchases or interact during a certain period of time. The frequency will analyze based on customer loyalty. Data frequency is usually in the form of total transactions or interactions carried out within a certain period.
3. Monetary, also be referred to as monetary value. Monetary will reflect the amount spent by customers over a certain period of time. Monetary will be able to show the big buyers in a certain period.

E. Forecasting

The selection of the forecasting model is adjusted to the data type and horizon to be used. In this study, there is historical data in the form of a time period from September 2020 to July 2021 and the calculation will only look for needs per 2 weeks according to the storage time of fruits. Therefore, the time series model is the right model to use for forecasting with the aim of short-term forecasting and the existence of historical data per time period [13].

Simple exponential smoothing requires alpha parameter (α) as a smoothing factor in forecasting. Calculate the forecast using the simple exponential smoothing method using the following equation [14]:

$$F_{t+1} = F_t + \alpha\,(D_t - F_t)$$

Description:

F_{t+1} : Forecasting value for the next period
F_t : Forecasting value in period t.
D_t : Value of demand in period t.
α : Smoothing Factor ($0 < \alpha < 1$)

In ARIMA there are forecasting weights, namely the values of p, d, and q. In ARIMA, the p-value is the autoregression (AR) model, d is the degree of difference and Q is the moving average model. To determine the value of p, d, and q in the ARIMA model, auto_arima will be used to make it easier to determine the amount of value used. To see the most suitable model, it can be seen from the comparison of the error values (e) of the two models.

Evaluation of the accuracy model is done by looking at the Mean absolute error (MAE), Mean Squared Error (MSE), and Root Mean Squared Error (RMSE) values.

$$\text{MAE} = 1 / n\ (\sum e)$$

$$\text{MSE} = 1 /n\ (\sum(ei)^{2})$$

$$\text{RMSE} = \sqrt{MSE}$$

The smaller the error value, the smaller the MAE, RMSE, and MSE [15]. So that the model made can be ensured to have better quality

F. SWOT Analysis

SWOT analysis is a process of planning that can help a company to overcome challenges and see new prospects that can be targeted in the future [16]. The use of SWOT Analysis is expected to be able to help organizations to have full awareness of all the factors that can influence the business decisions taken. Factors in the SWOT analysis are divided into 2, namely internal factors and external factors. Internal factors will relate to the internal environment of the company such as organizational functions. In SWOT will be grouped into strengths (strengths) and weaknesses (weaknesses). External factors are factors that come from outside the company such as competitors, suppliers, the industry's environment, or market conditions. External factors are grouped into opportunities (opportunities) and threats (threats) [17]. After the SWOT framework is created as below and filled in according to the state analysis of the company, several recommendations and strategies will be made based on the framework.

To do the weighting in the SWOT analysis is usually done by using the results of a survey. In addition to this method, the reduction of bias in the determination of weighting can be done by using a risk management matrix. In the SWOT weighting with the risk management matrix, the impact value is used to measure the perceived influence of a process, and the probability value is used to measure the probability that a process will actually occur. Figure 3 presents a risk management matrix [18].

Fig. 3 *Strategic Risk Severity Matrix*

III. Data Description

To get segmentation from customers, customer transaction data is needed from January 2021 to March 2021 to be processed later using the RFM method before clustering is carried out to see the characteristics of the customer. The transaction data used are transaction date data, transaction account data, purchase nominal data, and data on the type of product purchased.

While the data used for forecasting is fruit salad sales data for September 1, 2020, to July 24, 2021. The data is obtained from the monthly performance report of GrabFood merchants. In calculating the need for fruit from July 25 to August 6, 2021, based on the results of forecasting sales of fruit salads, data on the demand for fruit is used in one box of fruit salad (one serving). **Table I** presents the use of fruit in one serving of fruit salad.

TABLE I
The Need for Fruit in One Serving of Salad

	Number of Fruits Needs
1 box of fruit salad	0,126 kg harum manis manggo
	0,2 kg premium fuji apple
	0,2 kg honey pir
	0,17 kg chile grape
	0,18 kg non-seeded red watermelon
	0,18 kg melon skyrocket

To calculate the amount of capital to purchase fruit needs based on forecasting sales of fruit salads, the price of each fruit purchased comes from price data from one supplier at the Tanah Tinggi Main Market. **Table II** presents the cost of purchasing fruit in kilogram.

TABLE II
The Price for Fruit in Kilogram

Fruit Types	Price (@ Kg)
Harum manis mango	Rp. 20.000
Premium fuji apple	Rp. 34.000
Honey pear	Rp. 30.000
Chile grape	Rp. 100.000
Non-seeded red watermelon	Rp. 7.000
Melon skyrocket	Rp. 15.000

IV. The Research Process

Based on the topics raised in this research, the appropriate methodologies to use are quantitative methods and qualitative methods. The quantitative method is a method used in research conducted systematically, where the data is processed in the form of numbers, tables, graphs, or diagrams in a structured and detailed manner to obtain optimal results. This research consists of several processes. Figure 4 has presented an overview of the research process which is displayed in the form of a flow chart.

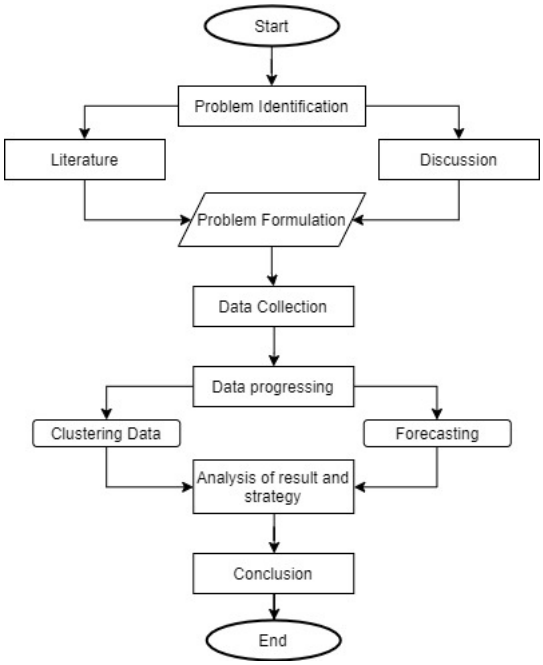

Fig. 4 *Research Flow Chart*

In this final project research, customer segmentation will be carried out based on the value of the customer, then the RFM method is used to see loyalty and also the economic characteristics of MSMEs customers. Segmentation will be done using the k-means clustering method. Then to solve the problem of excess inventory in fruit salad sales, a short-term forecast of 2 weeks is carried out by comparing the use of ARIMA and simple exponential smoothing. From the two data,

an analysis of target customers will be carried out which can be the opportunities and strengths of the store in the future. The results of the analysis are made strategies that can be implemented based on the results of the SWOT analysis made of course also pay attention to the results of the analysis of forecasting.

In this study, the scope of research is divided into assumptions and limitations used in the process of data analysis in research. Here are some assumptions used to simplify and clarify the research process, as follows.

1. The data used is data sourced from daily data and monthly performance reports of GrabFood merchants.
2. Transaction data used comes from online sales data via GrabFood.
3. It is assumed that the need for fruit is calculated based on the need for fruit in the manufacture of fruit salad production.
4. The sales data for fruit salad used is derived from the GrabFood merchant's monthly performance report data.
5. It is assumed that in one week there are 6 days, this assumption is used based on grab foods weekly sales data from the monthly performance report wherein one month there are 5 weeks.

In this study, there are several limitations used to clarify the research process, as follows:

1. Research discusses 3 focuses of discussion, namely market segmentation, prediction of raw material needs for fruit, and analysis of sales strategy.
2. The customer segmentation process is carried out using the K-means clustering method.
3. The forecasting process is carried out using simple exponential smoothing and ARIMA forecasting models.

V. Experiment Result

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A. Customer segmentation

Before the transaction data is clustered, the data must be transformed using the RFM method. The data transformation process is carried out using a pivot table in excel. The frequency data is taken from the amount (COUNTA) of the 'purchase date' in the transaction data of each account. Monetary data comes from the average of the total purchases of each transaction per account. The recency data comes from the difference between the end of the month, April 1, 2021, and the 'last transaction date' for each account. In fig 5 is a description of RFM data for 268 customers who made transactions from January 2021 to March 2021.

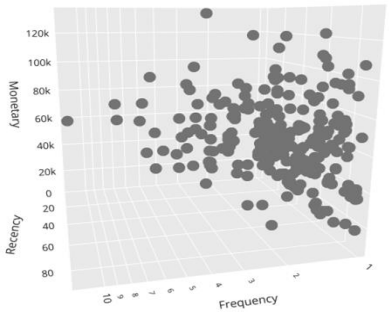
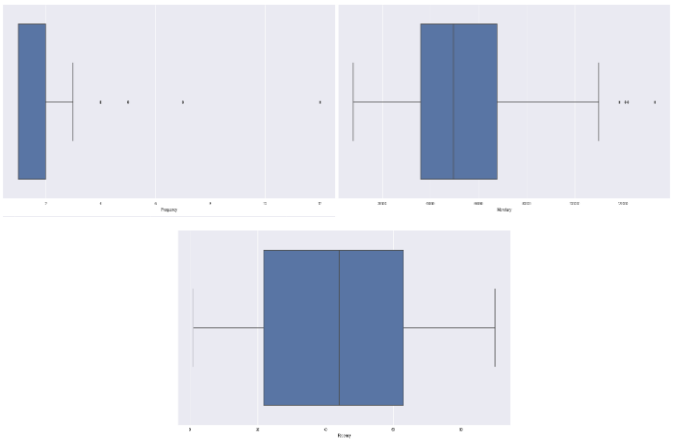


Fig. 5 *3D Scatter Plot for RFM Data*

The RFM data will be analyzed outliers to ensure the cleanliness of the data when the clustering process is carried out. Outlier analysis uses a boxplot to see the range of variables in figure 6.

Fig. 6 *Boxplot Data Frequency, Monetary, and Recency*



From the boxplot data, the outlier value will be replaced by using the upper limit value and the lower limit value of each variable. The change in value will adjust the proximity to the boundary value. This change in value will not affect the results of the data because the data is replaced with a limit value that can represent it. Based on the boxplot, the outliers in the Monetary data will be changed to the upper limit value.

To determine the best clustering results, it is necessary to select the right number of clusters. In determining the number of clusters can be used elbow method. In the elbow method, the inertia value or the midpoint of each cluster of each N-cluster is determined first. With a range of cluster divisions from 1 to 10, **Table III** presents the inertia values of each N-cluster.

TABLE III
INERTIA VALUE OF EACH N-CLUSTER

Inertia Value (N-*Cluster*)									
1	2	3	4	5	6	7	8	9	10
44,25	23,83	17,52	13,87	11,79	10,08	8,80	7,86	7,17	6,56

From this inertia value, a line graph can be formed to find out in the N-cluster how much the value begins to decrease gradually. **Figure 7** is a graph of the k-elbow from the RFM data.

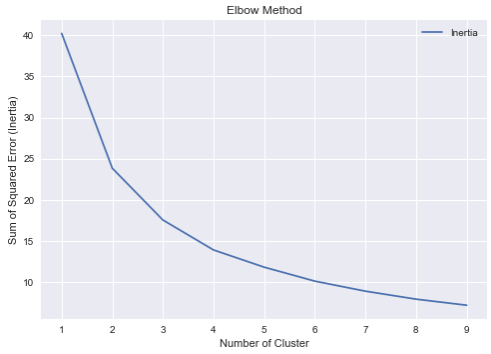


Fig. 7 graph of the k-elbow from the RFM data

To perform the best number of cluster divisions, it can be done by looking at the silhouette value. Where the search is carried out until the highest silhouette value is obtained. Based on the calculation of the silhouette value, it is found that the division of clusters into 3 is the choice of cluster division with the best results, **Table V** presents the silhouette values of each N-cluster.

TABLE V
SILHOUETTE VALUES OF EACH N-CLUSTER

Silhouette Values (N-cluster)				
2	3	4	5	6
0,379	0,398	0,347	0,329	0,310

To pay more attention to the distribution of clusters in the data, Figure 8 presents a 3D depiction of transaction data that has been grouped into 3 clusters.

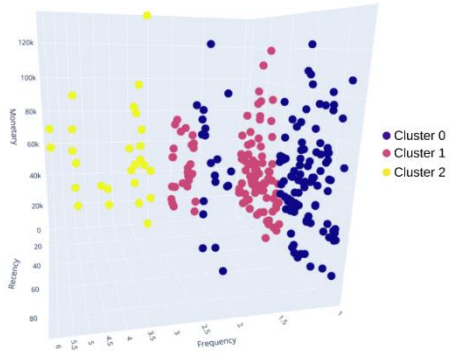


Fig. 8 3D depiction of transaction data that has been grouped into 3 clusters

B. Forecasting

Before the forecasting process is carried out, the data is first carried out with a unit root test to determine whether the data is stationary or not. The unit root test was performed using the Dickey-Fuller test. In the Dickey-fuller test, testing will be carried out =

Null hypothesis (Ho):

There is an indication of the existence of a unit root in the data so that the data is not stationary.

The alternative hypothesis (H1):

The rejection of the null hypothesis where the data has no unit root and is stationary.

The interpretation of the unit root test results is done by looking at the p-value of the test. If the p-value of the unit root test results is greater than 0.05 then the null hypothesis (Ho) will be accepted, meaning that the data has a unit root and is not stationary. Meanwhile, if the p-value of the test is less than or equal to 0.05, then the null hypothesis (Ho) is rejected, meaning that the data does not have a unit root and is stationary [19]

Based on the Dickey-Fuller test in **table VI** on historical data on fruit salad sales, the p-value of the unit root test results is greater than 0.05. Then the null hypothesis (Ho) is accepted. The data belongs to the non-stationary data type. Therefore, it is necessary to transform non-stationary data into stationary data to facilitate the data modelling process.

TABLE VI
THE DICKEY-FULLER TEST ON HISTORICAL DATA ON FRUIT SALAD SALES

Description	**Result**
Test Statistics	-2,134
P-*value*	0,231
Critical Value (1%)	-3,581
Critical Value (5%)	-2,926
Critical Value (10%)	-2,601

We need a transformation method that can transform data into stationary data. To reduce or eliminate the trend in the data and stabilize the mean value which causes the data to be non-stationary, the differencing method can be used [21]. Differentiating the data is done by calculating the difference between one period and the previous period. Based on historical sales data which has been transformed by the differencing method in **Figure 11**, the mean value becomes more stable after one time of the differencing method.

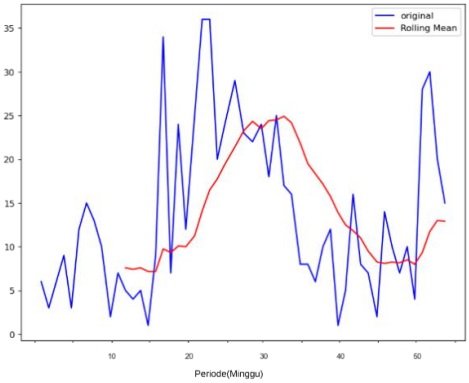


Fig. 10 F*ruit Salad Sales Data*

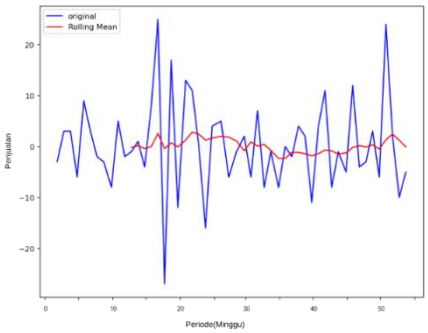


Fig. 11 F*ruit Salad Sales Data after Differencing*

In forecasting with the simple exponential smoothing method, the determination of the alpha value is carried out using a solver in excel to reduce the MAE value. The choice of MAE is compared to RMSE or MSE because the MAE value is the absolute difference between the actual data and the forecast data so that later analysis of the magnitude of the loss can be done easily. Based on the smallest MAE value, the value for the simple exponential smoothing method is 0.17.

In Figure 12, the prediction results generated from the simple exponential smoothing method seen from the graph analysis are very far from the original value.

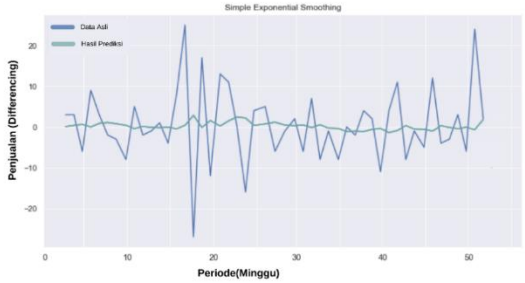


Fig. 12 *Simple Exponential Smoothing Result*

Therefore, other forecasting methods are needed that can produce even better values. Based on the amount of historical data, there are 53 periods of historical data used for forecasting. By using auto_arima, the values of p, d, and q are 0, 0, and 1. By using ARIMA modeling, the forecasting model is better than simple exponential smoothing. In Figure 4.14, the forecasting results are almost similar to the train data.

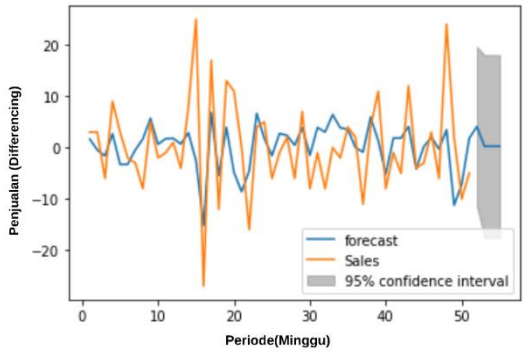


Fig. 13 *ARIMA model Result*

Based on the comparison of MAE, MSE, and RMSE in **table VII**, the prediction results generated using ARIMA have a better error value than using simple exponential smoothing.

TABLE VII
TABLE COMPARISON OF MSE AND RMSE DATA TEST VALUES

Deskripsi	*Simple exponential smoothing*	ARIMA
MAE	8,7	4,7
MSE	85,38	25,14
RMSE	9,24	5

In the MAE test data value, ARIMA has a difference in value from the original data with the forecasting result of 4.75. Then there is a possibility that there is an excess of forecasting results as much as 5 boxes of fruit salad. If the actual sales are less, there will be losses due to excess purchases of raw materials. The loss to be borne financially is Rp. 181,400 based on **table VIII**. When compared to the average net profit per week in July 2021, which is Rp. 1,199,200, the value of the error is still very acceptable for the store.

TABLE VIII
TOTAL COST LOSS OF EXCESS FRUIT (5 SERVINGS)

Number of Fruit Needs	Price (kg)	Total buying price
0,63 kg of harum manis manggo	Rp. 20.000	Rp. 12.600
1 kg of premium fuji apple	Rp. 34.000	Rp. 34.000
1 kg of honey pear	Rp. 30.000	Rp. 30.000
0,85 kg of chile grape	Rp. 100.000	Rp. 85.000
0,9 kg of non-seeded red watermelon	Rp. 7.000	Rp. 6.300
0,9 kg of melon sky rocket	Rp. 15.000	Rp. 13.500
Total Cost of Losses		Rp. 181.400

The results of forecasting with the ARIMA method obtained differencing values of fruit salad sales in the next 2 periods are 8 and 9. So that in the next 2 weeks it is predicted that the number of fruit salads sold is 23 boxes and 32 boxes. Total sales from July 25, 2021, to August 6, 2021, were 55 boxes of fruit salad. Furthermore, it is necessary to calculate the need for fruit to produce as many as 55 boxes of fruit salad. Calculation of the number of fruit needs based on the data in table 4.1 regarding the need for fruit in one serving of fruit salad. The number of needs for each fruit in the table is multiplied by 55 boxes to get the number of needs for each type of fruit. In **table IX** is the number of fruit needs based on the prediction results for the next 2 weeks.

TABLE IX
TOTAL ALL THE NEEDS AND COSTS OF RAW MATERIALS FOR FRUIT

Number of Fruit Needs	Price (kg)	Total buying price
7 kg of harum manis manggo	Rp. 20.000	Rp. 140.000
11 kg of premium fuji apple	Rp. 34.000	Rp. 374.000
11 kg of honey pear	Rp. 30.000	Rp. 330.000
9,5 kg of chile grape	Rp. 100.000	Rp. 950.000
10 kg of non-seeded red watermelon	Rp. 7.000	Rp. 70.000
10 kg of melon skyrocket	Rp. 15.000	Rp. 150.000
Total Purchase Cost		Rp. 2.014.000

To meet the need for fruit from July 25, 2021, to August 6, 2021, Chunky Monkey Cake Shop must prepare a fund of Rp. 2,014,000 to purchase fruit needs in the manufacture of 55 boxes of fruit salad.

C. SWOT Analysis

In making a business strategy using SWOT analysis, it is necessary to identify external and internal factors that can influence consumer behavior. Analysis of internal and external factors can be taken based on 4 factors that influence customer behavior, namely personal factors, psychological factors, social factors, and cultural factors. Therefore, an analysis of internal factors is carried out by identifying store conditions such as psychological factors, namely customer responses, social factors through social media interactions, forms of promotion, or business financial conditions. While external factors are seen in personal factors, namely the customer's economy and lifestyle, cultural factors, psychological factors such as the response to halal food globally in Indonesia and from the environment, namely the scope of the MSME environment and market share from the results of customer segmentation. In the process of identifying the internal and external factors of the Chungky Monkey Cake Shop, it is done by observing the state of the business and the literature that discusses the making of a SWOT strategy in food stores or SMEs.

To assess the weight in factors S (Strengths), W (Weaknesses), O (Opportunities), and T (Threats) on the SWOT diagram, the impact variable is used to assess the probability of the outcome occurring as well as the probability variable regarding the probability of the impact occurring. The matrix value comes from the impact value multiplied by the probability value and produces a matrix value. The matrix value will be divided by the sum of the matrix values for each factor to get the weight of each identification factor. Table 4.4 presents the weight value of the SWOT diagram from Factor S and Factor W. In table 4.4 presents the weight value of the SWOT diagram from Factor O and Factor T.

After calculating the weights and strategies, do the preparation of the matrix and EFE by assessing and calculating the total weight. in the IFE matrix, for factor S (Strength) rank 4 is a major strength while rank 3 is a minor strength. As for the W (Weakness) factor, it uses a rating of 2 for minor

TABLE X
IDENTIFICATION OF FACTORS AND STRATEGIES IN SWOT ANALYSIS.

	Strengths	***Weaknesses***
	1. The existence of legality in business, trademark, and product (S1)	1. The main customers are only around 10.45% of the total customers. (W1)
	2. High-profit margin (S2)	2. Small capital scale (less than Rp. 5,000,000). (W2)
	3. Have a good relationship with a reliable supplier (S3)	3. Giving a discount with a high minimum purchase (W3)
	4. Very high customer satisfaction (S4)	4. Passive marketing, so the store is less well known in the community (W4)
	5. Ability to create new products faster to respond to customer needs. (S5)	5. Inventory recording is still manual (W5)
Opportunities	**SO (*Attacking Strategies*)**	**WO (*Reinforce Strategies*)**
1. Having potential customers of 42% of the total customers with an average purchase of Rp. 46,000.	1. Create a new beverage or a package of healthy food with prices ranging from Rp. 46,000 to Rp.60,000 by considering the availability of goods from suppliers. (S2-S4-S5-O1-O2-O3)	1. Using 70% of government funds for promotion by providing gifts for healthy food menus and packages according to customer needs with a minimum purchase potential of Rp. 50,000 to increase the loyalty of potential buyers. (W1-W2-W3-W4-O1-O2-O3-O4-O5)
2. As many as new market potential due to the development of a healthy lifestyle trend in the community.		
3. Newmarket potential from an increase in parcel sales during the pandemic.		
4. Training and MSME Capital Assistance from the Government.	2. Creating advertising promotions and adding forms of legality to packaging to improve reputation with government assistance funds (S1-S4-O4-O5)	2. Using 20% of government funds to subscribe to a share listing application. (W5-O4)
5. Procurement of city promotion tours provided by GrabFood.	3. Make a discount for the purchase of healthy food and bundling packages with a minimum purchase of Rp. 60,000 by 20% (S3 – O4 –O5)	
Threats	**ST (*Develop Strategies*)**	**WT (*Avoid Strategies*)**
1. Monthly raw materials payable up to Rp. 3,000,000.	1. Utilizing a 5% profit margin and securing raw materials from the most desirable types of food through suppliers to ensure product selling prices do not increase suddenly due to increased taxes and unstable raw materials. (S2-S3-T2-T3-T4)	1. promotions above 40% with a minimum purchase using the main customer data, which is below Rp. 60,000 during the pandemic to outperform other competitors using the cost of capital. (W1-W2-W3-T1-T2-T4)
2. The decline in economic conditions due to the pandemic.		
3. Instability of raw material prices		
4. Increased sales tax by online food delivery services by 5%.	2. With the legality of the business, trademark, and product as well as a high satisfaction rating, it is superior to several businesses that have joined (S1-S4-T5)	2. Subscribe to recorder application and design services for social media by using capital funds and closing products whose raw materials have increased. (W4-W5-T3-T5)
5. Increasing MSMEs using online services.	*3. Create a limited menu of new products that have a smaller profit margin and focus on increasing sales volume to make debt payments (S5-T1-T2-T5)*	

weaknesses and 1 for major weaknesses. Table X presents identification of factors and strategies in SWOT analysis. The rating used in the EFE matrix or evaluation of external factors ranges from 4 to 1 where 4 is a superior response while 3 is a response above the average weight and 2 is a response on average and 1 represents a poor response. The ranking is adjusted according to the results of the weighting.

TABLE XI
MATRIX IFE

Strengths	Matrix Value	Weight
1. The existence of legality in business, trademark, and product (S1)	10	0,06
2. High-profit margin (S2)	20	0,14
3. Have a good relationship with a reliable supplier (S3)	10	0,06
4. Very high customer satisfaction (S4)	12	0,08
5. Ability to create new products faster to respond to customer needs. (S5)	20	0,14
Weaknesses		
1. The main customers are only around 10.45% of the total customers. (W1)	25	0,16
2. Small capital scale (less than Rp. 5,000,000). (W2)	16	0,11
3. Giving a discount with a high minimum purchase (W3)	4	0,03
4. Passive marketing, so the store is less well known in the community (W4)	10	0,06
5. Inventory recording is still manual (W5)	25	0,16
Total of matrixs value	152	

TABLE XII
MATRIX EFE

Opportunities	Matrix Value	Weight
1. Having potential customers of 42% of the total customers with an average purchase of Rp. 46,000.	25	0,14
2. As many as new market potential due to the development of a healthy lifestyle trend in the community.	25	0,14
3. Newmarket potential from an increase in parcel sales during the pandemic.	25	0,14
4. Training and MSME Capital Assistance from the Government.	4	0,03
5. Procurement of city promotion tours provided by GrabFood.	15	0,09
Threats		
1. Monthly raw materials payable up to Rp. 3,000,000.	25	0,14
2. The decline in economic conditions due to the pandemic.	20	0,12
3. Instability of raw material prices	6	0,04
4. Increased sales tax by online food delivery services by 5%.	12	0,07
5. Increasing MSMEs using online services.	15	0,09
Total	152	1

Based on the results of the calculation of the IFE and EFE matrices, in tables X and XI, the results of the calculation of the internal Cartesian diagram will be the x-axis and the calculation of the external Cartesian diagram will be the y-axis in Figure 4.20 of the SWOT Cartesian diagram.

Based on Figure 14, it is known that the condition of the MSME is in quadrant I with coordinates x is 1 and y is 0.56. Therefore, the strategy that is suitable to be used today is the SO strategy which is a strategy to take advantage of opportunities with the company's strengths. The following are business strategies that can be used based on the opportunities and strengths of the MSME:

1. Create a new menu of food/beverage or a package of healthy food hampers with prices ranging from Rp. 46,000 to Rp. 60,000 by considering the availability of goods from suppliers.
2. Make advertising promotions and add forms of legality to packaging to increase reputation with government assistance funds.
3. Make a discount for purchasing healthy food and bundling packages with a minimum purchase of 60,000 at 20% of the product selling price only when the promo tour process is carried out.

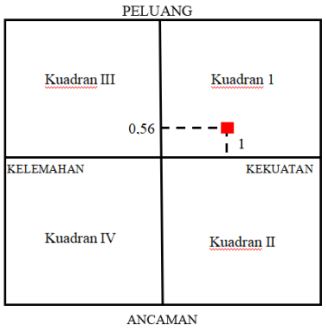


Fig. 14 *SWOT Cartesian diagram*

VI. DISCUSSION

A. Customer Segmentation Based on Clustering Result

To find out the characteristics of the data in each cluster, table XIII shows the characteristic values of each cluster.

TABLE XIII
CHARACTERISTIC VALUES OF EACH CLUSTER

Cluster	Deskripsi	*Recency*	*Frequency*	*Monetary*
C0	Min.	41	1	Rp.13.000
	Max	90	2	Rp. 122.000
	Mean	66,39	1.16	Rp. 56.981
	St.Dev	12,48	0,3	Rp. 24.780,3
C1	Min.	1	1	Rp. 8.000
	Max	48	2	Rp. 118.500
	Mean	23,34	1,24	Rp. 46.047,7
	St.Dev	12,26	0,43	Rp. 20.781,1
C2	Min.	2	3	Rp. 28.614
	Max	54	6	Rp. 133.334
	Mean	27	3,86	Rp. 60.656,2
	St.Dev	15,84	1,11	Rp. 23.234,8

Based on the comparison data, the following is the grouping of customers based on the value of recency, frequency, and

monetary. Of course, this grouping will help Chungky Monkey Cake Shop to analyze the types of customers who have the potential to increase sales revenue with strategies that will form later.

1. Lapsed-one-time buyer

   Customers in cluster C0 can be categorized as old customers who have just made an average purchase of 1 transaction at the store. This customer has the possibility to have left the store because they have not purchased for up to 3 months. For this customer, it will cost a lot of money to attract buying interest in the product again because in this group 127 customers control 47.4% of customers from January 2021 to March 2021. This cluster can be included in the needs attention category, about to sleep, or hibernating and is included in the category of high-risk consumers. For this reason, it is necessary to carry out promotional strategies such as limited-time promotions, freebies, special discounts for products that have high demand, and release old products that have added more value and a direct approach through social media.

2. One-time buyer new

   Customers in cluster C1 can be categorized as buyers whose purchase intensity is small, namely 1 purchase in a 3-month period. Customers in C1 have a smaller mean recency than the other clusters, which is about 23 days. So there is a possibility that this customer is new. This is also supported by the low average purchase size of Rp. 46,000. In addition to having recently made a purchase and only made 1 transaction and also has a low purchase value, C1 has a high probability of developing into a major customer. Later these customers will be able to become a big influence on the direction of development of store sales because the number is greater than the main customers, which is 113 customers. This type requires a strategy that can build customer loyalty by providing the right product at the right price and holding a promotional strategy that can increase the purchasing power of customers. Type of customer C1 is the type of customer that needs to be taken into account in making a sales strategy. This type of customer can be categorized as recent users and potential loyalists. Customers in cluster 1 can be fostered by providing other product recommendations and free trial offers on new or old food menus. These customers have the potential to become loyal consumers.

3. Main customers

   The main customers are customers who have a high level of loyalty. The type of customer in C2 often purchases 3 to 6 transactions in the last 3 months with an average purchase size of Rp. 60,000 in other clusters. Based on the number of customers, this cake shop only has 10.4% of the main customers of its total customers. Customers in this cluster are loyal consumers who in the marketing approach to increase purchasing activities by providing superior offers in the services provided and can be targeted for selling products that have high prices. These customers need to be involved in providing reviews on social networks, to help increase the reputation of the business's products and brands.

From the results of Chungky Monkey's customer segmentation, the type of customer is dominated by high-risk customers and new customers. Therefore, in making a strategy, a strategy is needed that can increase loyalty from new customers and can reactivate high-risk customers. Then the strategy made later will be close to providing promos or free trials that can increase purchasing activity and the number of loyal customers. Figure 15 presents the percentage of customer segmentation on Chungky Monkey.

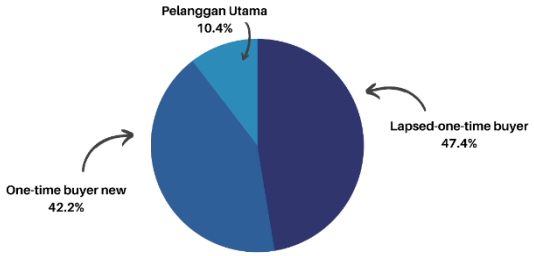


Fig. 15 *The percentage of customer segmentation on Chungky Monkey.*

B. *Analysis of Forecasting Results of Fruit Salad Sales*

Prediction results using ARIMA successfully predict an increase from the first week period to the second week period where in the first week predictions will sell 23 boxes and the second week sell 32 boxes. In the prediction results with the original sales data, there is a difference in excess prediction of 13 boxes of fruit salad where in that period there were sales of 42 boxes of fruit salad, namely 17 boxes in the first period and 25 boxes in the second period. the reason is the increase in the price of fruit salad by 8.3%.

In addition, the presence of MAE from ARIMA forecasting calculations also affects the difference between the original and predicted values, if based on MAE there will be a shortage or excess of 5 boxes of fruit salad every week. Based on the difference between the original data and the predicted number of boxes each week, in the first week, from July 25 to July 30, 2021, there was a difference of 6 boxes of fruit salad and in the second week from August 1, 2021, to August 6, 2021, there was a difference of 7 boxes of fruit salad.

C. *Practice Analysis of Business Strategy Results on MSMEs*

Based on the calculation of the EFE and IFE matrices, the general conclusion based on current conditions is the use of aggressive strategies in sales. Strategy analysis through SWOT analysis still needs to be done in detail by combining factors that can influence consumer behavior and business performance. Further analysis needs to be done because the SWOT analysis is prone to subjectivity and prejudice. In

strategy analysis, consumer behavior factors determine the practice of interacting with customers. Customer behavior is influenced by 4 factors, namely personal factors, psychological factors, social factors, and cultural factors.

In identifying trends in the SWOT analysis, factors that can influence consumer behavior are the legality and good customer response to services or products that are included in psychological and cultural factors. These factors can be an approach in the process of implementing an aggressive strategy. Increasing the interest in the brand by using the strength of past customer responses and the legality of the business/product will help influence customer behavior through psychological factors and cultural factors. The approach of social factors going through social media. One other strategy that must be developed later is to increase interaction and networking in Chungky Monkey's social media.

The first strategy is a strategy to make a discount on the purchase of healthy food and bundling packages with a minimum purchase of 60,000 at 20% of the selling price of the product only when the promo tour process is carried out, including the influence of personal and social factors. Where the strategy is taken into account the economic factors of the customer segment by providing a minimum purchase that is in the average monetary data from this cluster of lapsed one-time buyers or high-risk consumers.

In addition to the economy, other personal factors are also taken into account, namely lifestyle, the existence of lifestyle changes in the identification of opportunities in the SWOT analysis ensures that this strategy will influence changes in customer behavior. The change in lifestyle to a healthy lifestyle and online led to an increase in the demand for healthy food and gift delivery for hospitality. This factor is also a psychological factor and a cultural factor to attract customers who have a good response and need for healthy food as well as the influence of Indonesian traditional culture such as during the Great Religious Holiday which can increase the interest in buying products. This first promotional strategy will be able to encourage to overcome high-risk consumers by considering personal factors, namely the economy and lifestyle, psychological factors from customers who need healthy food, and also through business and food legality, cultural factors, namely friendship traditions, and social factors. namely from the customer group environment. Of course, the social factor of this strategy requires increased interaction and networking in Chungky Monkey's social media.

The approach that can be taken to new customers is the introduction of other Chungky Monkey products and the addition of value from food to attract this type of customer. In the second strategy, the conclusion of the SWOT analysis is to create a new menu of food/beverage or hamper packages with prices ranging from Rp. 46,000 to Rp. 60,000 by considering the availability of goods from suppliers, can be a strategy for new one-time buyers who are recent users and potential loyalists. This strategy can be personalized, namely by providing a bundling promo of the popular Chungky Monkey product with a new food menu. The purpose of this is to take advantage of psychological factors, namely responses from foods that have high interest and personal factors from an economic point of view. Product bundling can also be done on other products, both between products that have high sales, for a deeper correlation analysis can be carried out between products for making promotional packages by adjusting the buying behavior of customers. Trials can be done not only on the menu but can also be added to the menu, such as giving freebies to toppings on fruit salads.

In the marketing strategy to the main customer segments, the marketing focus is on increasing the value and services of the business. By adding a form of legality to the packaging, it has added value to the product to give the effect of the psychological and cultural factors of the legality to the customer. In addition, customers in this segment can be involved in influencing psychological factors in other customer segments, with testimonials or social media coverage regarding the good response to Chungky Monkey.

Apart from the concept of consumer behavior and market segmentation, the strategy made must look at the resources of the business. Based on the forecasting results from July 25 to August 6, 2021, Rp. 2,014,000. Sales of fruit salad from raw fruit have high prospects in customer interest because of the influence of personal factors, namely a healthy lifestyle and psychological factors from customers who need healthy food. In the opportunity identification factor in the SWOT analysis, there is an opportunity for capital from the government. In July, the government received assistance through BNI to MSMEs amounting to Rp. 2,400,000. This assistance in the short term must be divided into capital needs for product creation, performance, and promotion of the business.

Chungky Monkey has an average monthly capital of Rp. 4,320,000 for the purchase of raw materials and product packaging. Based on the results of the calculation of the raw material needs for fruit salad in the 2-week period from July 25 to August 6, 2021, there is still an excess of remaining capital for the needs of cake products. So that government assistance funds can be used to carry out promotions and also increase social media networks where it is recommended in Instagram ads that a large capital for advertising marketing is Rp. 50,000 per day. If done in a week, then the amount of funds to be issued is Rp. 350,000. In conclusion, in August a marketing strategy can be carried out for the three customer segments using funding from the government. Calculation of this need must always be carried out every month to ensure that the existing capital can finance the marketing strategy of each customer. If there is a shortage of capital, the marketing strategy used focuses on the lapsed one-time buyer customer segment and the new one-time buyer customer segment. **Table XIV** presents a strategy that has been personalized to each customer.

TABLE XIV
PERSONALIZED STRATEGY BASED ON CUSTOMER SEGMENTATION

Customer Segment	Strategy
Lapsed one-time buyer	1. Make a discount for the purchase of healthy food and hampers with a minimum purchase of 60,000 at 20% of the selling price of the product. 2. Increasing interaction and social media networks by doing advertisements and content that can attract traffic to Chungky Monkey's social media. 3. Making advertising promotions and adding legality forms to packaging to improve reputation with government assistance funds.
One-time buyer new	1. Create new food/beverage menus or healthy food hampers with prices ranging from Rp. 46,000 to Rp.60,000 by considering the availability of goods from suppliers. 2. Promotion of freebies toppings for food and drink menus or new or old freebies that you want to introduce to customers 3. Making product bundling promos on menus that have high interest with new menus or on other menus that have good customer response ratings. 4. Making advertising promotions to introduce new and old food menus as well as reviews with the aim of increasing reputation.
Core customer	1. Free topping promotions for food and beverage menus to increase product value. 2. Increasing the form of packaging to make it attractive according to the value of the price. 3. Engage core customers to provide reviews or testimonials on social media networks.

VII. CONCLUSION

From the segmentation results, 3 customer segmentation groups are consisting of lapsed-one-time buyers, one-time buyers, and main customers, each group consisting of 127 customers, 113 customers, and 28 customers. The dominance of customer segmentation is the lapsed-one-time buyer customer type, which is 47.4%. Meanwhile, based on the prediction results, the best forecasting model is the ARIMA forecasting method. The results are predicted that from July 25 to August 6, 2021, there will be sales of 55 boxes of fruit salad. Therefore, the required funds amounting to Rp. 2,014,000 to purchase fruit with a possible loss due to forecasting errors of Rp. 181,400 per period (week). And based on the results of strategy analysis obtained 9 strategies that can be applied to 3 customer segments. Meanwhile, from the analysis of the need for fruit raw materials for fruit salad, if the raw material capital is used from Chungky Monkey, there is still excess capital remaining for the needs of cake products. So that government aid funds can be used to carry out promotions and also increase social media networks. If there is a shortage of capital, the marketing strategy used focuses on the lapsed one-time buyer customer segment and the new one-time buyer customer.

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