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PREDICTING SKINCARE SALES OF ORIGINAL MS GLOW WITH SES METHOD

Feby Ariska[1], Rizaldi[1], Sumantri[1]
[1]Information System, Universitas Royal
email: febyariska0402@gmail.com

Abstract: Ms Glow Kisaran Original Store is one of the beauty companies that sells skincare products that are useful for maintaining healthy facial and body skin. However, the Original Ms. Glow series currently faces challenges such as tight competition and ineffective inventory management in terms of sales figures. This company sells ± 1500 products a month, but also often faces shortages and stockpiles of product, which can reduce customer confidence and cause Ms. Glow Kisaran Original to experience financial losses, among others. Conversely, if the demand for skincare increases but the skincare supply cannot be prepared, this is a loss for the store and customers. The purpose of this study is to improve the accuracy of the forecast, the use of the Single Exponential Smoothing Method is proposed. This method smoothes past values with exponential weights, placing greater emphasis on the latest data. The use of data from the last 12 months as reference data for past recording for forecasting experiments for the next 1 (one) month. The results of the study at Ms Glow Kisaran show the flexibility of the method in adapting to different sales dynamics. Overall, this research helps in predicting skincare sales predictions at the Ms Glow Kisaran Original Kisaran Store using the Single Exponentian Smoothing method, so that it can overcome the challenges in predicting sales figures.

Keywords: ms glow kisaran; skincare sales; ses.

Abstrak: Toko Ms Glow Kisaran Original merupakan salah satu perusahaan di bidang kecantikan yang menjual produk-produk skincare yang bermanfaat untuk menjaga kesehatan kulit wajah dan tubuh. Namun rangkaian Original Ms. Glow saat ini menghadapi tantangan seperti persaingan yang ketat dan pengelolaan inventaris yang kurang efektif dalam hal angka penjualan. Perusahaan ini menjual ±1500 produk dalam sebulan, namun juga sering menghadapi kekurangan dan penumpukan stok produk, yang dapat menurunkan kepercayaan pelanggan dan menyebabkan Ms. Glow Kisaran Original mengalami kerugian finansial. Sebaliknya jika permintaan akan skincare meningkat namun persediaan skincare tidak dapat disiapkan maka ini menjadi kerugian bagi pihak toko dan pelanggan. Tujuan penelitian ini adalah untuk meningkatkan ketepatan perkiraan, penggunaan Metode Single Exponential Smoothing diusulkan. Metode ini menghaluskan nilai masa lalu dengan bobot eksponensial, memberikan penekanan lebih besar pada data terbaru. Penggunaan data 12 bulan terakhir sebagai data acuan pencatatan masa lalu untuk percobaan peramalan untuk 1 (satu) bulan kedepan. Hasil penelitian pada Ms Glow Kisaran menunjukkan fleksibilitas metode dalam menyesuaikan diri dengan dinamika penjualan yang berbeda. Secara keseluruhan, Penelitian ini membantu dalam meramalkan prediksi penjualan skincare di Toko Ms glow Kisaran Original Kisaran menggunakan metode Single Exponentian Smoothing, sehingga dapat mengatasi tantangan dalam memprediksi angka penjualan.

Kata kunci: ms glow kisaran; penjualan skincare; ses.

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INTRODUCTION

The skin care industry has grown rapidly in the last decade, driven by increasing public awareness of the importance of skin care and beauty [1]. One brand that stands out in the Indonesian market is Ms Glow, which is known for its various high-quality products designed to meet consumer needs. With tight competition, it is important for Ms Glow to be able to meet consumer demand efficiently, especially in terms of managing product inventory.

Ms Glow is a cosmetics brand originating from Indonesia and has succeeded in attracting the attention of many consumers, especially women [2]. The main mission of Ms Glow is to help each user achieve healthy, radiant skin and still look beautiful [3].

Ms Glow Kisaran Original Shop is a sales unit that offers various skincare products and other skin care needs. The products sold by this shop are various types, namely Facial Wash Ms Glow, Glow-ing Toner, Whitening Day Cream, Cush-ion, Loose Powder, Lipstick and so on. To remain competitive with other skincare stores in the area, store managers try to increase the attractiveness and sales of products to customers. Sales of goods at the Ms Glow Kisaran Original Store tend to change according to fluctuating customer demand.

This inconsistent change in demand has a direct effect on the inventory of goods available in stores. Activities that take place at the MS Glow Kisaran Original Store include transactions for purchasing stock of skincare goods. In the process of purchasing stock of goods, the MS Glow Kisaran Original Store often experiences problems, namely trouble figuring out how much stock has to be bought for the upcoming quarter, because currently it has not implemented a forecasting method to determine the stock of goods to be acquired [4].

Ms Glow Kisaran Original shop faces uncertainty in demand for beauty skincare products during the production process, which causes the number of products produced to be uncertain. This can result in losses due to excessive product buildup or not optimal profits when product stock decreases.

Stock management is a crucial aspect for retail companies, including the MS Glow Store which sells quality cosmetic and skin care products. However, the challenges faced in stock management are often related to uncertain sales patterns and fluctuations in demand from customers. This phenomenon makes it difficult for companies to make optimal decisions regarding the procurement of goods for the next period. Ms Glow Kisaran Original Store is experiencing uncertainty and fluctuations in product sales data. Diverse and uncertain historical data makes it difficult for companies to predict future demand. For example, a new product from Ms Glow may get high attention at the start of its launch, but its sales may decline drastically as time goes by. Inaccurate data analysis can result in overstock (excess stock) or stockout (out of stock).

Based on the problems described in the paragraph above, a solution is needed to help increase system efficiency and effectiveness in implementing a technology-based stock inventory management system. By using integrated inventory management software, companies can monitor and manage stock in real-time. This allows monitoring inventory-related data, such as sales

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volume, remaining stock and procurement time, more accurately. Flexible inventory management by implementing just-in-time (JIT) methods can also be beneficial [5].

This method allows reducing storage costs and the risk of out-of-date goods, by aligning product procurement according to dynamic consumer demand. For this reason, researchers are trying to provide a solution, namely building an information system for sales of Ms Glow Kisaran Original cosmetic products using forecasting using a method, namely Single Exponential Smoothing.

An approach that exhibits exponentially declining weighting of older observation values is the Single Exponential Smoothing technique. In other words, values from more recent observations are comparatively given more weight than those from earlier observations. An exponentially weighted moving average of all prior observation values is produced by this approach. Seasons and trends have little effect on this approach [6].

The Single Exponential Smoothing method has been widely used in several case studies including, Further research The findings of this study, titled "Application of the Single Exponential Smoothing Method in Website-Based Coffee Sales Forecasting (Case Study: HU Coffee Shop)" [7]. For this test, coffee sales data from April 2022 to July 2023 were used. The data used in this study encompassed the time frame from June 1, 2023, to July 10, 2023, and the sample used was HU Milk Coffee.

Additional research under the title "Application of Exponential Smoothing on GRDP Growth Rates on the Basis of Constant Prices According to Business Fields in Central Java Province" [10], reveals that the Triple Exponential Smoothing method, with alpha parameters of 0.29 and beta 0.7, can offer the best forecasting, and gamma 0.68 yielded an MAE of 1.24 and an RMSE of 2.68. 5.175, 5,171, 4,736 and 5,497 are the prediction numbers generated in Quarter III 2023 and Quarter II 2024, respectively. Additional investigation under the heading "Forecasting Analysis of According to the findings of "Internet Installations Using the Single Moving Average and Exponential Smoothing Method" [8], in October 2022, there were 28 requests for Stroomnet service installation using the Single Moving Average Method for three months, and 26 requests using the single exponential smoothing method. The SMA method has an error rate that is more sophisticated than the SES method. For forecasting order requests in this study, the SMA method is better used because it has the smallest error rate in forecasting.

A forecasting system capable of predicting future skincare sales is required in this situation. which will later become a reference in the stock preparation process at Ms Glow Original Range. Therefore, the Exponential Smoothing method is used to predict skincare sales, particularly when seasonal trends and patterns are evident in the data. By using this technique in the forecasting system, it is hoped that it can minimize and approach the actual value, so that Ms Glow Original Range can speculate on the stock of skin care that will be sold to consumers.

METHOD

The calculation algorithm uses the Single Exponential Smoothing method to predict skincare sales at Ms Glow Kisaran Original. The Single Exponential

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Smoothing (SES) method is a method that uses very little past data recording and assumes fluctuating or unstable data. Exponential smoothing is a weighted moving average forecasting technique where data is weighted by an exponential function [9].

Exponential smoothing a moving average forecasting method with sophisticated weighting, but is still easy to use [10], each data used in this method is given a weight which is symbolized α (alpha) alpha value which ranges from 0 to 1 which produces a level value that error the smallest will be selected for use in the forecasting model [11].

The SES method is used in this study because SES provides exponentially decreasing weights on historical data, making it more responsive to recent trend changes, while SMA provides equal weights on all data within a certain time period.

The following are the stages of the SES method. data collection, alpha value selection, forecast initialization, forecast calculation, forecast evaluation, and adjustment.

The skincare data from 2024 is as in table 1.

Table 1. Skincare Sales Data

No	Month	Facial Wash	Glowing Toner	Whitening Day Cream	Cushion	Lipstick	Loose Powder
1	Jan-24	50	45	45	11	10	15
2	Feb-2	45	58	40	15	8	10
3	Macr-24	45	50	50	10	7	10
4	Apr-24	51	50	50	13	10	12
5	Mey-24	55	45	49	10	10	15
6	Jun-24	60	50	50	10	10	10
7	Jul-24	55	48	40	15	6	12
8	Aug-24	58	50	45	14	9	15
9	Sep-24	59	55	55	13	10	10
10	Oct-24	50	48	52	15	10	10
11	Nov-24	45	51	48	15	9	10
12	Dec-24	50	50	50	12	9	15

The Single Exponential Smoothing approach considers that the data is unstable or oscillating and requires relatively little historical data. A moving average forecasting technique with complex weighting that is nonetheless user-friendly is exponential smoothing. For inventory amount data, the computation employs the Single Exponential Smoothing algorithm, which means that α = alpha [12].

The following is the formula for the Single Exponential Smoothing (SES) method:

$$Ft + = \alpha Xt + (1- \alpha) \quad (1)$$

Description:
α : Parameter value of $0<\alpha<1$
$Xt-1$: Actual value at time(t-1)
$Ft-1$: Forcasting value at time(t-1)
Ft : Forecasting value at time t

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There are a number of ways to gauge a forecast's accuracy, including: The mean square of the value difference between the estimated and actual values is known as the mean square error, or MSE.

$$MSE= \frac{\Sigma| x_t-F|^2}{n} \quad (2)$$

Mean Absolute Deviation (MAD)

$$MAD =\Sigma \left(\frac{\text{Actual-Forecast}}{n}\right) \quad (3)$$

Mean Absolute Percentage Error (MAPE)

$$MAPE= \left(\frac{100\%}{n}\right) \sum_{t-1}^{n} | \frac{x_t-f_t}{x_t} \quad (4)$$

RESULTS AND DISCUSSION

The results of the research on Ms Glow range using Single Exponential Smooting, namely Facial Wash Glowing Toner, Whitening Day Cream, Cushion Loose Powder and Lipstick. An example of the calculation for one of the skincare products, namely Facial Wash. Simplifying tasks at the Ms Glow Kisaran Original Kisaran Store, especially in terms of forecasting demand for Ms Glow beauty skincare products and encouraging more rapid and significant development at the Ms Glow Kisaran Original Kisaran Store. can be seen in table 2.

Table 2. Example of Skincare Facial Wash Calculation

Month	Actual Data (Yt)	Ft	Abs Error | Yt-Ft|	Error^2 $\|Yt-Ft\|^2$	Abs Error/Yt
January 2024	50				
February 2024	45	50,00	5,00	25,00	11,11%
March 2024	45	45,50	0,50	0,25	1,11%
April 2024	51	45,05	5,95	35,40	11,67%
May 2024	55	50,41	4,60	21,11	8,35%
Juny 2024	60	54,54	5,46	29,81	9,10%
July 2024	55	59,45	4,45	19,84	8,10%
Agustus 2024	58	55,45	2,55	6,53	4,40%
September 2024	59	57,74	1,26	1,58	2,13%
October 2024	50	58,87	8,87	78,76	17,75%
November 2024	45	50,89	5,89	34,66	13,08%
December 2024	50	45,59	4,41	19,46	8,82%
January 2025	-	49,56	-	-	-
Total			48.94	272,39	95,63%

Calculation of forecasting inventory of skincare products in the period January 2025:

$F_{Jan\ 2025} = \alpha\ Y_{Dec\ 2024} + (1 - \alpha)\ F_{Dec\ 2024}$
$= (0,1\ x\ 45,59) + (1\ -0,9)\ 45,59$
$= 49,56$

Mean Absolute Deviation (MAD) is the first measure of overall forecasting error for a model:

$$MAD= \frac{|At-Ft|}{n} = \frac{48,94}{11} =4,45$$

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Mean Absolute Percentage Error (MAPE):

$$MAPE = \frac{|At-Ft|(100)}{Yt} = \frac{95,63}{11} = 8,69\%$$

The following are the results of forecasting using the Single Exponential Smooting method, namely Facial Wash with Alpha 0.9, namely 8.69%, Glowing Toner with Alpha 0.4, namely 5.78%, Whitening Day Cream with Alpha 0.5, namely 8.49%, Cushion with Alpha 0.2, namely 16.03%, Loose Powder with Alpha 0.4, namely 22.36% and Lipstick with Alpha 0.1 which is 14.96%. The error value results from skincare sales can be seen in table 3.

Table 3. Forecasting Error Value

No	Forecasting Error Value			
	Skincare Products	Forecasting Results	Alpha	Error Result
1	Facial Wash	50	0,9	8,69%
2	Glowing Toner	50	0,4	5,78%
3	Whitening Day Cream	50	0,5	8,49%
4	Cushion	13	0,2	16,03%
5	Lipstick	9	0,1	14,96%
6	Loose Powder	12	0,4	22,36%

The following is a graph of the Single Exponential Smoothing Method in predicting skincare sales, namely Facial Wash, Glowing Toner, Whitening Day Cream, Cushion, Loose Powder and Lipstick.

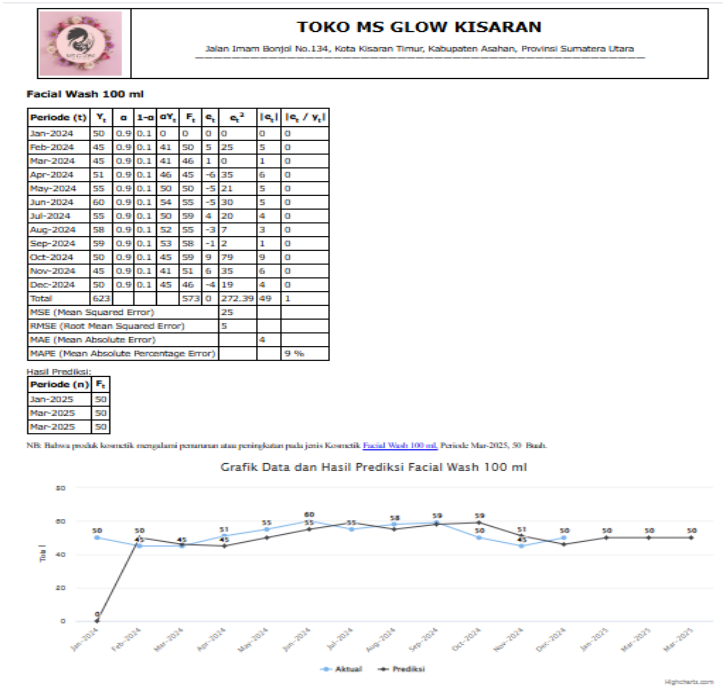

Image 1. Skincare Facial Wash

The Facial Wash graph is displayed because only Facial Wash has high sales due to its daily use for basic skin needs.

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CONCLUSION

The system created can predict the number of cosmetic product sales forecasts that must be prepared by the MS Glow Kisaran Original Store in the following month with Single Exponential Smoothing (SES) can help the MS Glow Kisaran Original Store. The mape value using the SES method is Facial Wash with Alpha 0.9 which is 8.69%, Glowing Toner with Alpha 0.4 which is 5.78%, Whitening Day Cream with Alpha 0.5 which is 8.49%, Cushion with Alpha 0.2 which is 16.03%, Loose Powder with Alpha 0.4 which is 22.36% and Lipstick with Alpha 0.1 which is 14.96%.

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