JURNAL

HUMANTECH
JURNAL ILMIAH MULTI DISIPLIN INDONESIA

VOL 1 NO 9 JULI 2022
E-ISSN : 2809-1612, P-ISSN : 2809-1620

FORECASTING BUDGETING ANALYSIS IN EVALUATING THE COMPANY'S FEASIBILITY IN MARKETING PROSPECTS

Nabilla Sekar Ayu[1] , Dian Hakip Nurdiansyah[2]

[1,2] *Singaperbangsa Karawang University*
[1]nabillasekarayu@gmail.com , [2]dian.hakipnurdiansyah@staff.unsika.ac.id

Info Artikel :
Diterima : 25 Juni 2O22 Disetujui : 9 Juli 2022 Dipublikasikan : 11 Juli 2022

Keyword : Forecasting, Exponensial Method, Exponensial smoothing

ABSTRACT

The purpose of this study is to determine three forecasting methods that can be used based on historical data forecasting chart patterns, determine the method accurate forecasting with the smallest error rate based on the three methods on product demand. The results of the research obtained are the forecasting graph which has a horizontal pattern due to fluctuations in values around the average, the forecasting calculation is it is known that there are three methods used, namely; Method Exponential, Exponential Smoothing with = 0.1 and Exponential Smoothing with = 0.2 So that The most appropriate method is used in analyzing the data with the highest error rate the smallest of the three methods used in the Atap H product for the January 2019 forecast, namely using the Exponential Smoothing Method with = 0.2 with a MAPE value of 72.962; MAD i.e 666,999.17; MSE is 444,887,888,334.03; and MFE which is 666,999.17.

INTRODUCTION

In order to face competitors and maintain continuity company, then good management is needed in the implementation of all company activities, one of which is in the field of planning and supervision. The company prepares plans in all fields, one of which is sales, for example by compiling a sales budget. Sales budget has an important role to assist management in determining management policies towards sales and directing activities company in achieving company goals. As stated by M.Munandar (2001:49) Sales Budget is a budget that plan in more detail about the company's sales during the period in the future, which includes plans regarding the type (quality) of goods to be sold, the amount (quantity) of goods to be sold, the price of goods will be sold, the time of sale and the place (area) of sale. Therefore sales forecasting (forecasting) is very necessary in preparing the budget sale.

There are several methods used in sales forecasting, including: other methods Free Trend, Half Average Trend, Trend Moment, Trend Least Square and Quadratic Trend. The effectiveness of sales forecasting is influenced by methods used and other factors outside the company, for example, the state of the country's economy that is influenced by the purchasing power of the people as consumers.

The choice of method must be adapted to the circumstances of the company, including the area of labor and the number of types of products sold. The effectiveness of

sales forecasting can be measured by a Standard Forecasting Error, where from the calculation It can be seen how much error rate of the method that has been used. The smaller the forecasting error rate, the more meaningful the method used is effective or in accordance with company conditions and can be applied in the company.

RESEARCH METHOD

To achieve the desired goal achieved is knowing forecasting demand for the product, then required observation and interviews. Interview activities are intended to obtain information addressed to each party assessed plays a direct role in the company's logistics process. Next supporting data recording gathering information on forecasting demand for goods, either in the form of primary data as well as secondary data. The following is the steps in doing forecasting

RESULTS AND DISCUSSION

The first step to takein forecasting demand in the periodfuture is to collect historical data. Here is the request data in 2018 can be seen in the table 1.

Table 1. Demand 2020

Month	Quantity
January	968,299
February	855,068
March	932,033
April	885,431
May	711,368
June	971,986
July	922,878
August	891,088
September	888,710
October	981,077
November	981,077
December	981,077
TOTAL	**10,970,092**

The following is a graph of the number of sales based on demand data in 2020 can be seen in Figure 4. From the results of the sales graph, you can identified that the pattern of change the request is Horizontal Pattern. Due to the rise and fall of sales with fluctuations that are still is around average. According to Heriansyah and Hasibuan (2017), on time series data time based, testing required before the data is processed with the data pattern test. The data pattern test is test whether it is said to be stationary or not. If there is a trend, seasonal or in the data cyclical, then it can be said that the data is not stationary, and vice versa. With the Horizontal chart pattern then it can be concluded that the data is stationary and methods that can be used to analyze the pattern of the cycle with forecasting method, Exponential and Exponential Smoothing with = 0.1, and Exponential Smoothing with = 0.2

Exponential Forecasting Method

Here is the forecast calculation by using the Forecasting Method Exponential which can be seen in table 2 and 3 the following.

Table 1. Forecasting Method Exponential (1)

Month	t	Y(t)
January	1	968,299
February	2	855,068
March	3	932,033
April	4	885,431
May	5	711,368
June	6	971,986
July	7	922,878
August	8	891,088
September	9	888,710
October	10	981,077
November	11	981,077
December	12	981,077
TOTAL	**78**	**10,970,092**

Table 2. Forecasting Method Exponential (2)

ln. Y(t)	t. ln. Y(t)	t2
13.7833	13.78	1
13.6589	27.32	4
13.7451	41.24	9
13.6938	54.78	16
13.4749	67.37	25
13.7871	82.72	36
13.7353	96.15	49
13.7002	109.60	64
13.6975	123.28	81
13.7964	137.96	100
13.7964	151.76	121
13.7964	165.56	144
164.67	**1,071.52**	**650**

Exponential Forecasting Methods After Regression Equation

Table 3. Exponential Forecasting Methods After Regression Equation (1)

Month	t	Y(t) = d
January	1	968,299
February	2	855,068
March	3	932,033
April	4	885,431
May	5	711,368
June	6	971,986

Month	t	Y(t) = d
July	7	922,878
August	8	891,088
September	9	888,710
October	10	981,077
November	11	981,077
December	12	981,077
TOTAL	**78**	**10,970,092**

Table 4. Exponential Forecasting Methods After Regression Equation (2)

Y'(t) = d'	(d-d')	[d-d']
(3.138)	968,302.14	968,302.14
(6.277)	855,074.28	855,074.28
(9.415)	932,042.41	932,042.41
(12.553)	885,443.55	885,443.55
(15.691)	711,383.69	711,383.69
(18.830)	972,004.83	972,004.83
(21.968)	922,899.97	922,899.97
(25.106)	891,113.11	891,113.11
(28.245)	888,738.24	888,738.24
(31.383)	981,108.38	981,108.38
(34.521)	981,111.52	981,111.52
(37.659)	981,114.66	981,114.66
(245)	**10,970,337**	**10,970,337**

Table 5. Exponential Forecasting Methods After Regression Equation (3)

(d-d')^2	(d-d')/n	[d-d']/d*100
937,609,030,998.05	80,691.84	100.0003
731,152,018,435.36	71,256.19	100.0007
868,703,063,062.02	77,670.20	100.0010
784,010,285,763.34	73,786.96	100.0014
506,066,756,391.46	59,281.97	100.0022
944,793,388,923.83	81,000.40	100.0019
851,744,350,863.43	76,908.33	100.0024
794,082,568,115.85	74,259.43	100.0028
789,855,667,276.03	74,061.52	100.0032
962,573,658,804.77	81,759.03	100.0032
962,579,816,800.68	81,759.29	100.0035
962,585,974,816.30	81,759.55	100.0038
10,095,756,580,251	**914,195**	**1,200.0266**

Exponential Forecasting Method Smoothing = 0.1

The following is an exponential forecasting method Smoothing with the equation:

$$\boldsymbol{Ft = Ft{-}1 + \alpha\ (A_{t-1} - F_{t-1})}$$

In the first period the value of d' or Y'(t) is 0
F_{t-1} = d' or Y'(t) in the period or previous month
A_{t-1} = d or Y(t) in the period or previous month

Table 7. Exponential Forecasting Method Smoothing = 0.1 (1)

Month	t	Y(t) = d
January	1	968,299
February	2	855,068
March	3	932,033
April	4	885,431
May	5	711,368
June	6	971,986
July	7	922,878
August	8	891,088
September	9	888,710
October	10	981,077
November	11	981,077
December	12	981,077
TOTAL	**78**	**10,970,092**

Table 8. Exponential Forecasting Method Smoothing = 0.1 (2)

Y'(t) = d'	(d-d')	[d-d']
-	-	-
96,829.900	758,238.10	758,238.10
85,506.800	846,526.20	846,526.20
93,203.300	792,227.70	792,227.70
88,543.100	622,824.90	622,824.90
71,136.800	900,849.20	900,849.20
97,198.600	825,679.40	825,679.40
92,287.800	798,800.20	798,800.20
89,108.800	799,601.20	799,601.20
88,871.000	892,206.00	892,206.00
98,107.700	882,969.30	882,969.30
98,107.700	882,969.30	882,969.30
998,901.500	**9,002,891.50**	**9,002,891.50**

Table 9. Exponential Forecasting Method Smoothing = 0.1 (3)

(d-d')^2	(d-d')^2/n	[d-d']/d*100
-	-	-
574,925,016,291.61	63,186.51	88.68
716,606,607,286.44	70,543.85	90.83
627,624,728,647.29	66,018.98	89.47
387,910,856,060.01	51,902.08	
811,529,281,140.64	75,070.77	
681,746,471,584.36	68,806.62	
638,081,759,520.04	66,566.68	
639,362,079,041.44	66,633.43	

(d-d')^2	(d-d')^2/n	[d-d']/d*100
796,031,546,436.00	74,350.50	
779,634,784,742.49	73,580.78	
779,634,784,742.49	73,580.78	
7,433,087,915,493	**750,241**	

Exponential Forecasting Method Smoothing = 0.2

Table 10. Exponential Forecasting Method Smoothing = 0.2 (1)

Month	t	Y(t) = d
January	1	968,299
February	2	855,068
March	3	932,033
April	4	885,431
May	5	711,368
June	6	971,986
July	7	922,878
August	8	891,088
September	9	888,710
October	10	981,077
November	11	981,077
December	12	981,077
TOTAL	**78**	**10,970,092**

Table 11. Exponential Forecasting Method Smoothing = 0.2 (2)

Y'(t) = d'	(d-d')	[d-d']
-	-	-
193,659.800	661,408.20	661,408.20
171,013.600	761,019.40	761,019.40
186,406.600	699,024.40	699,024.40
177,086.200	534,281.80	534,281.80
142,273.600	829,712.40	829,712.40
194,397.200	728,480.80	728,480.80
184,575.600	706,512.40	706,512.40
178,217.600	710,492.40	710,492.40
177,742.000	803,335.00	803,335.00
196,215.400	784,861.60	784,861.60
196,215.400	784,861.60	784,861.60
1,997,803.000	**8,003,990.00**	**8,003,990.00**

Table 6 Exponential Forecasting Method Smoothing = 0.2 (3)

(d-d')^2	(d-d')^2/n	[d-d']/d*100
-	-	-
437,460,807,027.24	55,117.35	77.35
579,150,527,176.36	63,418.28	81.65
488,635,111,795.36	58,252.03	78.95

285,457,041,811.24	44,523.48	75.11
688,422,666,713.76	69,142.70	85.36
530,684,275,968.64	60,706.73	78.94
499,159,771,353.76	58,876.03	79.29
504,799,450,457.76	59,207.70	79.95
645,347,122,225.00	66,944.58	81.88
616,007,731,154.56	65,405.13	80.00
616,007,731,154.56	65,405.13	80.00
5,891,132,236,838	**666,999**	**878.47**

Forecasting Error Test

Here is the test calculation forecasting error in the exponential method, exponential smoothing α = 0,1, exponential smoothing α = 0,2

Table 13. Forecasting Error Test (1)

Forecasting Method	MAPE	MAD
Exponential	100.002	914,194.73
E. Smoothing (0.1)	82.068	750,240.96
E. Smoothing (0.2)	72.962	666,999.17

Table 14. Forecasting Error Test (2)

MSE	MFE
835,752,008,299.53	914,194.73
562,861,495,560.92	750,240.96
444,887,888,334.03	666,999.17

Based on the analysis with the three the method, forecasting the value of the smallest error is the method Exponential Smoothing with = 0.2 with MAPE value or mean errorabsolute percentage of actual demandthe smallest is 72.962; MAD or average smallest absolute error (without pay more attention to forecasting results or small when compared to reality) namely 666,999.17; MSE or the average least squares error is 118,336,236,635.27; and MFE or average The smallest forecasting error is 666,999.17. So that the forecasting products uses Exponential Smoothing with = 0.2. MAPE usually means more compared to MAD because of MAPE express the percentage error of the result forecasting of actual demand during certain period which will give error percentage information is too high or too low.

Moving Range Verification

Moving Range Forecast Verification next period with the equation following:

$$MR = |(d't - dt) - (d'_{t-1} - d_{t-1})|$$

The results of the best method of forecasting are using the Exponential forecasting method Smoothing with = 0.2, here is calculation of verification results with Moving Range, which is the verification process carried out to find out whether the forecasting function that has been determined is quite representative For the data to be forecasted, it can be seen in table 15.

Table 15. Moving Range (1)

Month	t	d
January	1	968,299
February	2	855,068
March	3	932,033
April	4	885,431
May	5	711,368
June	6	971,986
July	7	922,878
August	8	891,088
September	9	888,710
October	10	981,077
November	11	981,077
December	12	981,077
TOTAL	**78**	**10,970,092**

Table 16. Moving Range (2)

d'	[d'-d]	MR
-	-	-
193,659.800	661,408.20	467,748.40
171,013.600	761,019.40	590,005.80
186,406.600	699,024.40	512,617.80
177,086.200	534,281.80	357,195.60
142,273.600	829,712.40	687,438.80
194,397.200	728,480.80	534,083.60
184,575.600	706,512.40	521,936.80
178,217.600	710,492.40	532,274.80
177,742.000	803,335.00	625,593.00
196,215.400	784,861.60	588,646.20
196,215.400	784,861.60	588,646.20
1,997,803.000	**8,003,990.00**	**6,006,187.00**

CONCLUSION

Based on the company's historical data, obtained a forecasting graph that has horizontal pattern due to value fluctuation is around the average then the calculation demand forecasting and rate the error is known that there are three the methods used are; Method Exponential, Exponential Smoothing with = 0.1 and Exponential Smoothing with = 0.2. Furthermore, the proper forecasting method can be determined based on the level the smallest error of the three the following methods exponential method that yields mean absolute deviation (MAD) 914,194.73, mean square error (MSE) 835,752,008,299.53, mean forecast error (MFE) 914,194.73, and mean absolute percentage error (MAPE) 961. Exponential Smoothing Method with = 0.1 which gives the mean absolute deviation (MAD) 750,240.96, mean square error (MSE) 562,861,495,560.92, mean forecast error (MFE) 750,240.96, and mean absolute percentage error (MAPE) 82.068. Exponential Smoothing Method with = 0.2 which gives mean absolute deviation (MAD) 666,999.17,

mean square error (MSE) 118,336,236,635,27 , mean forecast error (MFE) 444,887,888,334.03, and mean absolute percentage error (MAPE) 72.962.

DAFTAR PUSTAKA

Heriansyah, E. &. (2017). Implementasi Metode Peramalan Pada Permintaan Bracket Side Stand K59a. Jurnal PASTI. Vol. XII (2), 209-223.

Ilyas, N. F., & Irawan, A. (2021). Business Feasibility Towards Clothing Convection: A Case Study of Raiment. Malaysian Journal of Social Sciences and Humanities (MJSSH), 6(9), 545-560.

Kushartini, D. &. (2013). Sistem Persediaan Bahan Baku Produk Dispersant Di Industri Kimia. Jurnal PASTI. Vol. X (2), 217-234.

Molidya, A., Tameno, N., & Tomasowa, O. L. E. (2022). Pendampingan Perencanaan Dan Pengendalian Produksi Bagi Kelompok Perempuan Abhisai Tarus. Selaparang Jurnal Pengabdian Masyarakat Berkemajuan, 6(1), 377-380.

Msomi, T. S., & Olarewaju, O. M. (2021). Evaluation of access to finance, market and viability of small and medium-sized enterprises in South Africa. Problems and Perspectives in Management; Vol. 19, Issue 1.

Nasution, A. A. (2021). Perencanaan dan Pengendalian Produksi Pakan Ayam Produk PT Japfa Comfeed Indonesia Unit Tangerang (Doctoral dissertation, Universitas Multimedia Nusantara).

Rosdiani, V. (2018). Evaluasi Metode Peramalan Permintaan Dan Perencanaan Agregat Atap Harflex Di PT. Bakrie Building Industries. Magister. Universitas Gajah Mada.

Seto, S. N. (2016). Manajemen Farmasi : Lingkungan Apotek, Farmasi Rumah Sakit, Indutri Farmasi, Pedagang Besar Farmas. Diakses.

Sofyan, D. (2013). Perencanaan & Pengendalian Produksi. Lhoksemawe NAD.

Tampubolon, M. (2018). Manajemen Operasi & Rantai Pemasok-Edisi Revisi. Mitra Wacana Media.

Warella, S. Y., Hasibuan, A., Yudha, H. S., Sisca, S., Mardia, M., Kuswandi, S., ... & Prasetio, A. (2021). *Manajemen Rantai Pasok*. Yayasan Kita Menulis.

Zulhamidi., &. H. (2017). Peramalan Penjualan The Hijau Dengan Metode ARIMA (Studi Kasus Pada PT MK). Jurnal PASTI. Vol. XI (3), 231-244.