SITEKIN: Jurnal Sains, Teknologi dan Industri, Vol. 21, No. 1, Desember 2023, pp.35 - 41
ISSN 2407-0939 print/ISSN 2721-2041 online

Optimization of Trade Product Inventory Using Activity Based Costing Analysis

Venus Khatta Salsabillah[1], Ni Luh Putu Hariastuti[2]
[1.2] Department Magister of Industrial Engineering, Postgraduate Program, Institut Adhi Tama Surabaya
Jl. Arief Rahman Hakim No.100, Klampis Ngasem, Kec. Sukolilo, Surabaya, Jawa Timur
Email: venuskhatta6@gmail.com[1], putu_hrs@itats.ac.id[2]

ABSTRACT

Merchandise inventory is one of the assets that requires significant capital investment. If inventory is not managed properly, it can result in high storage costs, the risk of inventory shortages, or even expired products. Therefore, it is important to have the right strategy in managing inventory. This study aims to classify inventory items owned by UD. XYZ in order to minimize inventory costs by focusing inventory procurement on high-value priority items. The method used in this study is Activity Based Costing analysis (ABC). The results of this study are based on the ABC classification there are 7 types of goods that fall into category A or priority are Aoka, Roma sandwich, My jelly, Slai olai, Trick, Choco pie, and Chiki balls. Where these 7 types of goods need special attention in terms of inventory management because they absorb the most investment funds from the total goods owned. By knowing these items, companies can focus on more precise inventory management, including in terms of procurement, storage, and inventory control. This can help UD. XYZ reduces unnecessary storage costs and ensures optimal availability of goods. The results of this study can contribute to the understanding of the application of the ABC method in the context of merchandise inventory management.

Keywords: *ABC Analysis, Classification, Inventory, Optimization*

Introduction

The importance of good inventory management for a company so that inventory investment remains balanced and service to consumer satisfaction is maintained [1][2]. Poorly managed merchandise inventory can cause financial losses for the company. If too much merchandise is stored, the company will face high storage costs. On the other hand, if inventory is too low, companies can experience stock shortages that can affect the ability to meet customer demand[3]–[8].

UD. XYZ is a trading business engaged in the sale of various snacks and other snacks located in the city of Nganjuk, East Java. This company was founded in 2016, which started as a small-scale snack shop with only a few types of snacks. Nganjuk City is an industrial area with the largest producer of shallots in East Java [9]. This is in line with the rapid mobility of the population which greatly affects business development, especially the business of trading various snacks and snacks in the Nganjuk city area. The positive impact with the development of industry in Nganjuk city was also felt by the owner of this snack shop, which later changed its form into XYZ trading business. This company now sells a variety of snacks and snacks of various brands wholesale. Even recorded until now, this business has become the only official distributor agent of Aoka brand toast and became one *of the* largest snack suppliers in the city of Nganjuk.

This trading business has a fairly large turnover, which ranges from Rp. 200,000,000 to Rp. 400,000,000 per month. However, according to information from business owners, the expenses borne for inventory costs are also quite large if accumulated to reach 15-20% of the total monthly revenue turnover. This happens because this business has a fluctuating number of orders with inconsistent order frequencies and tends to increase before holidays. This trading business faces difficulties in understanding the value and priorities of each trade item owned. Without a clear understanding of the value and sales volume of each merchandise, inventory management becomes difficult to do effectively[7], [8], [10]–[12]. Companies need to prioritize products that have high sales value and a high level of damage risk. The activity aims to focus inventory control on high-value types of inventory rather than low-value ones[13]–[15], [15]–[19]. No research or action has been taken by business owners or other parties to solve this problem.

Some previous studies have proven that to classify merchandise inventory, you can use the Activity Based Costing method (ABC)[20][21]. The ABC method can optimize inventory costs by improving inventory management, identifying items that have the most impact on costs, and finding improvement opportunities that can reduce storage costs and increase overall profits[22][23]. From these findings, the purpose of this study is to classify inventory items owned by UD. XYZ in order to minimize inventory costs by focusing inventory

procurement on high-value priority items. The results of this study are expected to help UD. XYZ can optimize inventory management, allocate resources more effectively, make better decisions, and identify improvement and cost savings opportunities. All this will help the company achieve higher efficiency, increase profits and strengthen its competitive position in the market.

Research Methods

Research Design

This research is a quantitative descriptive research using activity-based costing analysis methods. The object of this study is UD. XYZ is engaged in buying and selling snacks and snacks in Nganjuk, East Java. This study uses secondary data containing data on the type of goods, data on buying and selling goods in January-December 2022. The data collection technique in this study used interview techniques on UD owners. XYZ, and the observations made went directly to the UD location. XYZ.

Stages of Data Analysis

The stages in sorting groups of goods using ABC analysis can be arranged based on the cumulative presentation of fund absorption and the presentation of the types of items of goods managed. The steps are as follows:

Calculation of fund absorption

$$Mi = Di \text{ x } pi \quad (1)$$

Information:
Mi = Absorption of funds
Di = Quantity (amount) of usage
Pi = Unit price of inventory

Calculation of percentage of absorption of funds

$$Pi = \frac{Mi}{\sum Mi} x100\% \quad (2)$$

Information:
Mi = Value of fund absorption
∑Mi = Total absorption value of funds

Order inventory items by annual volume of rupiah from largest in value to smallest.

Determine the cumulative percentage

$$\frac{\text{Volume tahuana dalam nilai uang per unit}}{\sum \text{Volume tahuana dalam nilai uang per unit}} \text{ x } 100\% \quad (3)$$

Classification into A, B, C respectively amounting to approximately 80%, 15% and 5% from above which can be drawn in the form of a pareto curve.

Possible policies based on ABC analysis include the following:

- The purchase of resources spent on supplier development should be much higher for item A than for item C.
- Item A, unlike items B and C, needs to have stricter physical inventory controls. Perhaps they can be placed in a safer place, and perhaps the accuracy of inventory records for item A should be more verified.
- The prediction of goods A needs to be more guaranteed of validity than the prediction of goods B and C.

Results and Discussion

For data on the types of goods taken are all types of goods sold by UD. Anugerah Snack has 60 types of goods. The qualification data taken is the name of the item, sales volume, and selling price. So that it will get a total of sales for 1 year. To calculate the absorption of funds by multiplying the sales volume (Di) and the price per unit (Pi). For the formula is as follows.

$$Mi = Di \text{ x } pi \quad (4)$$

An example for the calculation can be done to calculate the absorption value of funds of the type of Aoka goods as a follow-up.

The value of Aoka's fund absorption = 25700 x Rp. 105.000
= Rp. 2.698.500.000

For detailed calculations of all types of goods can be seen in the following table.

Table 1. Results of Annual Fund Absorption Calculation

No	Item Namn	Selling Price	Sales Volume (Box)	Fund Absorption Value (Mi)
1	Aoka	Rp 105.000	25700	Rp 2.698.500.000
2	My Jelly	Rp 165.000	785	Rp 129.525.000
3	Trick	Rp 200.000	468	Rp 93.600.000
4	Malkist	Rp 155.000	341	Rp 52.855.000
5	Chiki Balls	Rp 164.500	532	Rp 87.514.000
6	Better	Rp 185.300	411	Rp 76.158.300
7	Golda	Rp 120.000	80	Rp 9.600.000
8	Choco Pie	Rp 168.000	528	Rp 88.704.000
9	Cheetos	Rp 135.500	309	Rp 41.869.500
10	Tango	Rp 116.300	416	Rp 48.380.800
11	Chocolatos	Rp 129.000	144	Rp 18.576.000
12	Superstar	Rp 119.000	101	Rp 12.019.000
13	Pocari Sweat	Rp 127.000	105	Rp 13.335.000
14	Roma sandwich	Rp 270.000	650	Rp 175.500.000
15	Nextar	Rp 132.000	451	Rp 59.532.000
16	Twistko	Rp 145.000	412	Rp 59.740.000
17	Wafello	Rp 110.700	88	Rp 9.741.600
18	Sari Gandum	Rp 185.000	353	Rp 65.305.000
19	Selimut	Rp 133.400	128	Rp 17.075.200
20	Slai Olai	Rp 195.500	507	Rp 99.118.500
21	Arden	Rp 150.500	154	Rp 23.177.000
22	Cimory Botol	Rp 123.900	143	Rp 17.717.700
23	Pillows	Rp 132.000	411	Rp 54.252.000
24	Top Delfi	Rp 121.700	142	Rp 17.281.400
25	Chocolatos drink	Rp 130.000	126	Rp 16.380.000
26	Go potato	Rp 77.000	89	Rp 6.853.000
27	Chiki twist	Rp 110.000	112	Rp 12.320.000
28	Waffle	Rp 93.200	89	Rp 8.294.800
29	Superbob	Rp 89.500	65	Rp 5.817.500
30	Boyki	Rp 72.000	102	Rp 7.344.000
31	Jet-Z	Rp 64.000	149	Rp 9.536.000
32	Pulpy Orange	Rp 47.300	421	Rp 19.913.300
33	Siip	Rp 76.800	99	Rp 7.603.200
34	Fruit Tea pouch	Rp 47.500	168	Rp 7.980.000
35	Isoplus	Rp 34.900	168	Rp 5.863.200
36	Teh pucuk	Rp 55.000	384	Rp 21.120.000
37	Gorio	Rp 76.000	119	Rp 9.044.000
38	Coca Cola	Rp 36.500	166	Rp 6.059.000
39	Kriptos	Rp 41.300	151	Rp 6.236.300
40	Tic Tic	Rp 51.500	174	Rp 8.961.000
41	Mizone	Rp 43.000	177	Rp 7.611.000
42	Qtela	Rp 115.000	159	Rp 18.285.000
43	Ichi-Ocha	Rp 56.500	298	Rp 16.837.000
44	Egg Roll	Rp 46.000	153	Rp 7.038.000
45	Tiara net	Rp 68.000	114	Rp 7.752.000
46	Taro Net	Rp 64.000	103	Rp 6.592.000
47	Momogi	Rp 52.400	163	Rp 8.541.200
48	Sprite	Rp 36.500	143	Rp 5.219.500
49	Realgood	Rp 46.000	111	Rp 5.106.000
50	Bebeto	Rp 68.500	172	Rp 11.782.000
51	Fanta	Rp 36.500	156	Rp 5.694.000
52	Teh gelas botol	Rp 28.400	188	Rp 5.339.200
53	Floridina	Rp 31.000	170	Rp 5.270.000
54	Tebs	Rp 45.500	146	Rp 6.643.000
55	Siiplah	Rp 35.000	184	Rp 6.440.000
56	Milku	Rp 35.000	169	Rp 5.915.000
57	the rio	Rp 21.500	166	Rp 3.569.000
58	Bonita	Rp 98.500	129	Rp 12.706.500

59	okky jelly	Rp	24.500	139	Rp	3.405.500
60	Kopikap	Rp	20.200	133	Rp	2.686.600
	Total				**Rp**	**4.280.834.800**

After obtaining the results of the absorption of funds for each type of goods and their annual total value, the next step is to calculate the percentage of annual fund absorption. Calculating the percentage of absorption of funds can use the following formula.

$$\text{Presentase Pi} = \frac{\text{Mi}}{\sum \text{Mi}} x100\% \quad (5)$$

Information:
Mi = Value of fund absorption
∑Mi = Total absorption value of funds
From the formula above, the following is an example of the calculation on the type of Aoka goods as follows.

$$\text{Presentase Pi} = \frac{\text{Rp } 2.698.500.000}{\text{Rp } 4.280.834.800} x\ 100\%$$

= 63,04 %

It was found that the type of Aoka goods had a percentage of absorption of funds from the total funds of 63.04%. Data that has been calculated the percentage of absorption must first be sorted from largest to smallest. After the data is sorted, a cumulative percentage of fund absorption is calculated to find out which order of goods has the most to the least absorption of funds. After the cumulative percentage value is also known, it is possible to classify goods with ABC provisions. Based on pareto law, ABC analysis is classified into 3 categories, namely, class A goods are goods that provide high value[24]. Although group A is only represented by about 20% of the total inventory, the value given is 80% of the total absorption of funds. Class B goods are items that provide moderate value. This class B inventory group is represented by 30% of the total inventory and the resulting value is 15% of the total absorption of funds. Class C goods are items that provide low value. Class C inventory group is represented by 50% of the total existing inventory and the resulting value is 5% of the total absorption of funds[25][26].

In doing this classification, the value used as a benchmark is the cumulative percentage value. If the cumulative percentage value is 0% - 80%, then the goods fall into the category of class A. If the percentage of value is between 81% - 95%, it can be categorized as class B. And if the percentage of value ranges from 96% - 100%, then the goods fall into category C. From these provisions, the results of the ABC classification of inventory goods at UD. XYZ can be seen in the following table.

Table 2. ABC Analysis Results on all inventory items

No	Item Name	Sales Volume (box)	Selling Price	Fund Absorption Value (Mi)	Fund Absorption Percentage (%)(Pi)	Cumulative Percentage of Fund Absorption (%)	Class
1	Aoka	25700	Rp 105.000	Rp 2.698.500.000	63,04	63,04	A
2	Roma sandwich	650	Rp 270.000	Rp 175.500.000	4,10	67,14	A
3	My Jelly	785	Rp 165.000	Rp 129.525.000	3,03	70,16	A
4	Slai Olai	507	Rp 195.500	Rp 99.118.500	2,32	72,48	A
5	Trick	468	Rp 200.000	Rp 93.600.000	2,19	74,66	A
6	Choco Pie	528	Rp 168.000	Rp 88.704.000	2,07	76,74	A
7	Chiki Balls	532	Rp 164.500	Rp 87.514.000	2,04	78,78	A
8	Better	411	Rp 185.300	Rp 76.158.300	1,78	80,56	B
9	Sari Gandum	353	Rp 185.000	Rp 65.305.000	1,53	82,09	B
10	Twistko	412	Rp 145.000	Rp 59.740.000	1,40	83,48	B
11	Nextar	451	Rp 132.000	Rp 59.532.000	1,39	84,87	B
12	Pillows	411	Rp 132.000	Rp 54.252.000	1,27	86,14	B
13	Malkist	341	Rp 155.000	Rp 52.855.000	1,23	87,37	B
14	Tango	416	Rp 116.300	Rp 48.380.800	1,13	88,50	B
15	Cheetos	309	Rp 135.500	Rp 41.869.500	0,98	89,48	B
16	Arden	154	Rp 150.500	Rp 23.177.000	0,54	90,02	B
17	The pucuk	384	Rp 55.000	Rp 21.120.000	0,49	90,52	B
18	Pulpy Orange	421	Rp 47.300	Rp 19.913.300	0,47	90,98	B
19	Chocolatos	144	Rp 129.000	Rp 18.576.000	0,43	91,42	B
20	Qtela	159	Rp 115.000	Rp 18.285.000	0,43	91,84	B

21	Cimory Botol	143	Rp	123.900	Rp	17.717.700	0,41	92,26	B
22	Top Delfi	142	Rp	121.700	Rp	17.281.400	0,40	92,66	B
23	Selimut	128	Rp	133.400	Rp	17.075.200	0,40	93,06	B
24	Ichi-Ocha	298	Rp	56.500	Rp	16.837.000	0,39	93,45	B
25	Chocolatos drink	126	Rp	130.000	Rp	16.380.000	0,38	93,83	B
26	Pocari Sweat	105	Rp	127.000	Rp	13.335.000	0,31	94,15	B
27	Bonita	129	Rp	98.500	Rp	12.706.500	0,30	94,44	B
28	Chiki twist	112	Rp	110.000	Rp	12.320.000	0,29	94,73	B
29	Superstar	101	Rp	119.000	Rp	12.019.000	0,28	95,01	B
30	Bebeto	172	Rp	68.500	Rp	11.782.000	0,28	95,29	B
31	Wafello	88	Rp	110.700	Rp	9.741.600	0,23	95,51	C
32	Golda	80	Rp	120.000	Rp	9.600.000	0,22	95,74	C
33	Jet-Z	149	Rp	64.000	Rp	9.536.000	0,22	95,96	C
34	Gorio	119	Rp	76.000	Rp	9.044.000	0,21	96,17	C
35	Tic Tic	174	Rp	51.500	Rp	8.961.000	0,21	96,38	C
36	Momogi	163	Rp	52.400	Rp	8.541.200	0,20	96,58	C
37	Waffle	89	Rp	93.200	Rp	8.294.800	0,19	96,78	C
38	Fruit Tea pouch	168	Rp	47.500	Rp	7.980.000	0,19	96,96	C
39	Tiara net	114	Rp	68.000	Rp	7.752.000	0,18	97,14	C
40	Mizone	177	Rp	43.000	Rp	7.611.000	0,18	97,32	C
41	Siip	99	Rp	76.800	Rp	7.603.200	0,18	97,50	C
42	Boyki	102	Rp	72.000	Rp	7.344.000	0,17	97,67	C
43	Egg Roll	153	Rp	46.000	Rp	7.038.000	0,16	97,83	C
44	Go potato	89	Rp	77.000	Rp	6.853.000	0,16	97,99	C
45	Tebs	146	Rp	45.500	Rp	6.643.000	0,16	98,15	C
46	Taro Net	103	Rp	64.000	Rp	6.592.000	0,15	98,30	C
47	Siiplah	184	Rp	35.000	Rp	6.440.000	0,15	98,45	C
48	Kriptos	151	Rp	41.300	Rp	6.236.300	0,15	98,60	C
49	Coca Cola	166	Rp	36.500	Rp	6.059.000	0,14	98,74	C
50	Milku	169	Rp	35.000	Rp	5.915.000	0,14	98,88	C
51	Isoplus	168	Rp	34.900	Rp	5.863.200	0,14	99,02	C
52	Superbob	65	Rp	89.500	Rp	5.817.500	0,14	99,15	C
53	Fanta	156	Rp	36.500	Rp	5.694.000	0,13	99,29	C
54	Teh gelas botol	188	Rp	28.400	Rp	5.339.200	0,12	99,41	C
55	Floridina	170	Rp	31.000	Rp	5.270.000	0,12	99,53	C
56	Sprite	143	Rp	36.500	Rp	5.219.500	0,12	99,66	C
57	Realgood	111	Rp	46.000	Rp	5.106.000	0,12	99,77	C
58	the rio	166	Rp	21.500	Rp	3.569.000	0,08	99,86	C
59	okky jelly	139	Rp	24.500	Rp	3.405.500	0,08	99,94	C
60	Kopikap	133	Rp	20.200	Rp	2.686.600	0,06	100,00	C
Total					**Rp**	**4.280.834.800**	**100,0**		

From the table above, it can be seen that of the total 60 types of goods classified, only 7 goods are included in the class A category, where category A is the type of goods that absorb the most investment funds, which is 78.78%. If the total amount of funds absorption in class A is Rp. 3,372,461,500. For more details, the classification and total distribution of funds can be seen in the following table.

Tabel 3. ABC Classificasition Results

Category	Number of Items	Percentage of Amount (%)	Fund Absorption Value (Rp)	Percentage of Fund Absorption (%)
Class A	7	11,7	Rp 3.372.461.500	78,78
Class B	23	38,3	Rp 706.617.700	16,51
Class C	30	50	Rp 201.755.600	4,71
Total	**60**	**100,0**	**Rp 201.755.600**	**100,00**

The types of goods included in class A consist of 7 types of goods, namely Aoka, Roma sandwich, My jelly, Slai olai, Trick, Choco pie, and Chiki balls. Where these 7 types of goods need special attention in terms of inventory management because they absorb the most investment funds from the total goods owned. The results of this ABC classification analysis can be important information for UD owners. Anugerah Snack to give priority to inventory management for products in class A category. This aims not to cause large cost burdens and result in large idle funds and increase storage costs in category A.

To represent the results of ABC analysis on inventory of goods, a pareto curve can be formed containing 3 groups of goods based on the volume of annual fund absorption. For more details can be seen in the following picture.

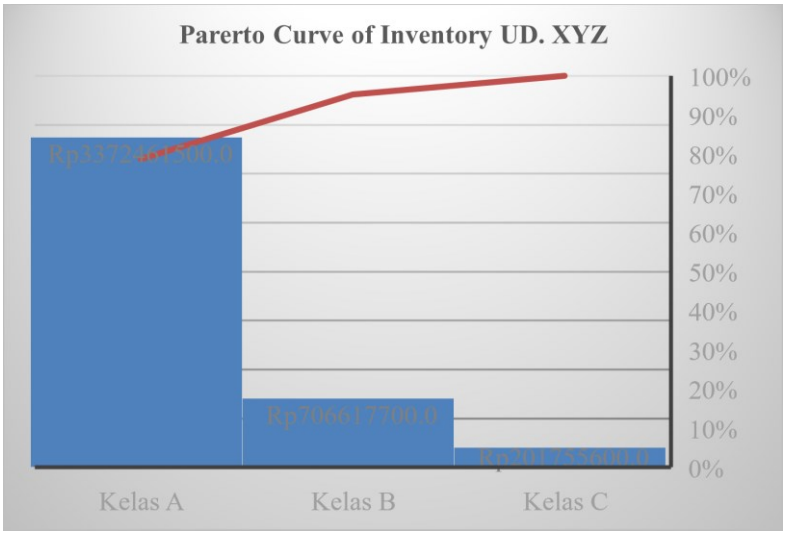

Figure 1. Pareto Curve ABC Classification Results

From the picture of the pareto curve above, it can be clearly seen the division of classes. That the types of goods included in category A must be reviewed more strictly than goods included in categories B and C to improve program efficiency or reduce inventory costs. In addition, priority in procurement activities is focused on high-value goods and high-quantity consumption use, which refers to class A goods.

Conclusion

By using UD's ABC (*Activity Based Costing*) method. XYZ can give a higher focus to 7 types of goods namely Aoka, Roma sandwich, My jelly, Slai olai, Trick, Choco pie, and Chiki balls. Where these 7 types of goods need special attention in terms of inventory management because they absorb the most investment funds from the total goods owned. The results of this ABC classification analysis can be important information for UD owners. Anugerah Snack to give priority to inventory management for products in class A category. This aims not to cause large cost burdens and result in large idle funds and increase storage costs in category A. By applying the ABC method can improve operational efficiency, reduce storage costs, improve responsiveness to customer requests, and optimize profits of UD. XYZ.

References

[1] D. rosa Indah, L. Purwasih, and Z. Maulida, "Pengendalian Persediaan Bahan Baku Pada PT. Aceh Rubber Industries Kabupaten Aceh Tamiang," *J. Manaj. dan Keuang.*, vol. 7, no. 2, p. 157, 2018, doi: 10.33059/jmk.v7i2.814.

[2] M. R. Isnantoro and N. L. P. Hariastuti, "Analisa Penggunaan Lot Sizing Dalam Perencanaan Persediaan Bahan Baku Dengan Menggunakan Metode Material Requirement Planning Di Pt. Xyz," 2023.

[3] P. E. Yuliana and S. Rahayu, "Analisis Pengaruh Penerapan Metode DRP Terhadap Bullwhip Effect Pada Rantai Suplai," *J. Inf. Syst. Hosp. Technol.*, vol. 1, no. 02, pp. 42–46, 2019, doi: 10.37823/insight.v1i02.46.

[4] D. Levia, "Analisis Proses Produksi CPO Untuk Mengidentifikasi Faktor-Faktor Yang Mempengaruhi Kualitas Mutu CPO," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 2, no. 2, pp. 82–89, 2023.

[5] N. A. Pratama, M. Z. Dito, O. O. Kurniawan, and A. Z. Al-Faritsy, "Analisis Pengendalian Kualitas Dengan Metode Seven Tools Dan Kaizen Dalam Upaya Mengurangi Tingkat Kecacatan Produk," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 2, no. 2, pp. 53–62, 2023.
[6] D. N. Setiawan, E. Mulyana, K. A. Rokhim, R. Nurraudah, and F. Yuamita, "Perancangan Produk E-Fruitcard Bagi Penyandang Tunagrahita," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 2, no. I, pp. 1–7, 2023.
[7] L. M. M. Ramdani, A. Z. Al Farity, and A. Z. Al Faritsy, "Analisis Pengendalian Kualitas Pada Produksi Base Plate R-54 Menggunakan Metode Statistical Quality Control Dan 5S," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 1, no. II, pp. 85–97, 2022.
[8] D. Prasisti and Y. A. Nugroho, "Optimasi Penjadwalan Produksi untuk Meminimalkan Makespan dengan Pendekatan Particle Swarm Optimization dan Genetic Algorithm," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 2, no. 2, pp. 111–118, 2023.
[9] D. Daniswari, "6 Fakta Kabupaten Nganjuk, 'Kota Angin' Penghasil Bawang Merah Terbesar di Jawa Timur," *kompas.com*, 2022. .
[10] B. W. D. Nugroho, N. J. K. Jakti, M. A. N. Rochman, and A. J. Nugroho, "Analisis Pengendalian Kualitas Produk Gula Dan Biaya Kualitas Dalam Menunjang Efektivitas Produksi:(Studi Kasus: PT Madu Baru Pg Madukismo)," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 2, no. 2, pp. 72–81, 2023.
[11] A. Syafitrah, A. Suhaini, M. F. Tonaji, and M. Syukri, "Analisa Standard Operating Procedure (SOP) Produksi PK (Palm Kernel) Menjadi PKE (Palm Kernel Expeller) Area KCP (Kernel Crushing Plant)," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 2, no. I, pp. 19–24, 2023.
[12] A. Dewangga and S. Suseno, "Analisa Pengendalian Kualitas Produksi Plywood Menggunakan Metode Seven Tools, Failure Mode And Effect Analysis (FMEA), Dan TRIZ," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 1, no. 3, pp. 243–253, 2022.
[13] E. Megawati, W. S. Saputra, Y. Attaqwa, and S. Fauzi, "Edukasi Pengurangan Resiko Terjadinya Musculoskeletal Disorders (Msds) Dini, Pada Penjahit Keliling Di Ngaliyan Semarang," *J. BUDIMAS*, vol. 03, no. 02, pp. 450–456, 2021.
[14] A. Z. Al Faritsy, "Analisis Pengendalian Kualitas Produk Ember Cat Tembok 5kg Menggunakan Metode New Seven Tools:(Studi Kasus: PT. X)," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 1, no. 3, pp. 231–242, 2022.
[15] A. Wicaksono and F. Yuamita, "Pengendalian Kualitas Produksi Sarden Mengunakan Metode Failure Mode And Effect Analysis (FMEA) Dan Fault Tree Analysis (FTA) Untuk Meminimalkan Cacat Kaleng Di PT XYZ," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 1, no. III, pp. 145–154, 2022.
[16] A. Wicaksono and F. Yuamita, "Pengendalian Kualitas Produksi Sarden Mengunakan Metode Failure Mode and Effect Analysis (FMEA) Untuk Meminimumkan Cacat Kaleng Di PT. Maya Food Industries," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 1, pp. 1–6, 2022, doi: https://doi.org/10.55826/tmit.v1iI.6.
[17] E. Sarwono, M. J. Shofa, and A. Kusumawati, "Analisis Perencanaan & Pengendalian Persediaan Bahan Baku Roti Pada UKM Produksi Roti," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 1, no. 4, pp. 349–360, 2022.
[18] R. Susanti, D. S. Ramadhan, P. P. Arwi, and M. Siregar, "Analisis Oil Losses Pada Stasiun Perebusan Produksi Crude Palm Oil (CPO) Menggunakan Metode Statistical Process Control (SPC)," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 2, no. 2, pp. 98–110, 2023.
[19] A. Anastasya and F. Yuamita, "Pengendalian Kualitas Pada Produksi Air Minum Dalam Kemasan Botol 330 ml Menggunakan Metode Failure Mode Effect Analysis (FMEA) di PDAM Tirta Sembada," *J. Teknol. dan Manaj. Ind. Terap.*, vol. 1, no. I, pp. 15–21, 2022, doi: https://doi.org/10.55826/tmit.v1iI.4.
[20] D. Guslan and I. Saputra, "Analisis Pengendalian Inventori Dengan Klasifikasi ABC dan EOQ Pada PT Nissan Motor Distributor Indonesia.," *J. Logistik Bisnis*, vol. 10, no. 1, pp. 73–77, 2020.
[21] E. Supriyadi and R. Nurdewanti, "Pengendalian Persediaan Bahan Baku dengan Metode Activity Based Costing (ABC) dan Economic Order Quantity (EOQ) di CV. XYZ," *Briliant J. Ris. dan Konseptual*, vol. 7, no. 1, p. 211, 2022, doi: 10.28926/briliant.v7i1.888.
[22] S. S. Mahagaonkar and P. A. A. Kelkar, "Application of ABC Analysis for Material Management of a Residential Building," *Int. Res. J. Eng. Technol.*, vol. 4, no. 8, pp. 614–620, 2017.
[23] O. Duran and P. S. L. P. Afonso, "An activity based costing decision model for life cycle economic assessment in spare parts logistic management.," *Int. J. Prod. Econ.*, vol. 222, no. 107499, 2020.
[24] C. W. Zheng and M. Y. Abu, "Application of activity based costing for palm oil plantation.," *J. Mod. Manuf. Syst. Technol.*, no. 2, pp. 1-14., 2019.
[25] R. JAELANI, "Implementasi Analisis Abc, Forecasting Dan Economic Order Quantity (Eoq) Untuk Meningkatkan Kelancaran Proses Operasi," (Doctoral dissertation, Universitas Mercu Buana Jakarta), 2020.
[26] R. L. Siregar, "Analisis Pengendalian Persediaan Bahan Baku Laundry Linen untuk Mengoptimalkan Persediaan di RSUD Dr. Pirngadi Kota Medan," (Doctoral dissertation, Universitas Sumatera Utara)., 2021.