SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 6, Number 1, October 2021
DOI : https://doi.org/10.33395/sinkron.v6i1.10898

e-ISSN : 2541-2019
p-ISSN : 2541-044X

TOPSIS method application in choosing the Most-Sale POS cashier machines and tools

Rani Irma Handayani[1*], **Normah**[2], **Deni Wironoto**[3]
[1) 2) 3)]Universitas Nusa Mandiri, Jakarta, Indonesia
[1)] rani.rih@nusamandiri.ac.id , [2)] normah.nor@nusamandiri.ac.id, [3)] deniwrnt07@gmail.com

Submitted : Feb 26, 2021 | **Accepted** : May 7, 2021 | **Published** : Oct 1, 2021

Abstract: PT. Mahadana Wikasita is a company engaged in the sale of machine goods and pos cashier tools. In order to face business competition, there are some problems that often arise regarding the sale of goods. PT. Mahadana Wikasita is lacking in monitoring the goods sold, what items consumers need, and the storage of data is less effective, so the company can not determine exactly which goods to buy. Therefore, a decision support system is needed that can help solve this problem. In this research, the decision support system used is by Techinique for Order Reference by Similarity to Ideal Solution (TOPSIS), which consists of seven stages using several criteria such as price, type, quality and customer interest. In the test results calculated using the Method For Order Preference bySimiliarity to Ideal Solution (TOPSIS) it can be concluded that the highest value is kios Pakmo mobile cashier application package with a value of 0.920, can be interpreted as the best selling item for one year.

Keywords: Decision Support System, Best Selling Goods Selection, Topsis

INTRODUCTION

PT. Mahadana Wikasita is a company engaged in the sale of machine goods and pos cashier tools. In order to face business competition, there are some problems that often arise regarding the sale of goods. Pt. Mahadana Wikasita is less in monitoring the goods sold, what goods consumers need, and the storage of data is less effective, so the company can not determine precisely which goods to buy (Benning et al., 2015).

The old way with manual systems can lead to slow decision making. This is of course caused by a very basic problem, namely improper decision making. Therefore, a decision support system is needed that can help solve the problem (Hia et al., 2018). One of the steps that can be taken to determine the best-selling goods is to implement a decision support system. With that step, the owner of the company can determine the best-selling goods with the right results and accuracy. (Murti et al., 2020).

A Decision support system or DSS, is a system to support the decision-making process. One commonly used method is TOPSIS. It is a method for decision making on multi-criteria issues and is one of the simplest and easiest to understand. One of the functions of TOPSIS is to determine the most sold products (Kurnia et al., 2020). Topsis uses the principle that the chosen alternative should have the closest distance from the positive ideal solution and the longest distance (furthest) from the ideal negative solution (Sefrika, 2018). With the method of topsis can improve the quality and quality of data so that the presentation of data information faster, accurate and easier (Ariandi et al., 2018). The implementation of TOPSIS method for this research is expected to provide maximum results in terms of decision making (Muzakkir, 2017)

LITERATURE REVIEW

The decision support system is designed to support all stages of decision making, ranging from identifying problems, selecting relevant data and addressing the approaches used in the decision-making process to evaluating the selection of existing alternatives (Sanyoto et al., 2017). The decision support system is a system that is able to solve problems efficiently, effectively, which aims to help decision making by choosing various alternative decisions (Sriani & Putri, 2018); one of the methods used for a decision support system is to use Topsis method (Wibisono et al., 2019).

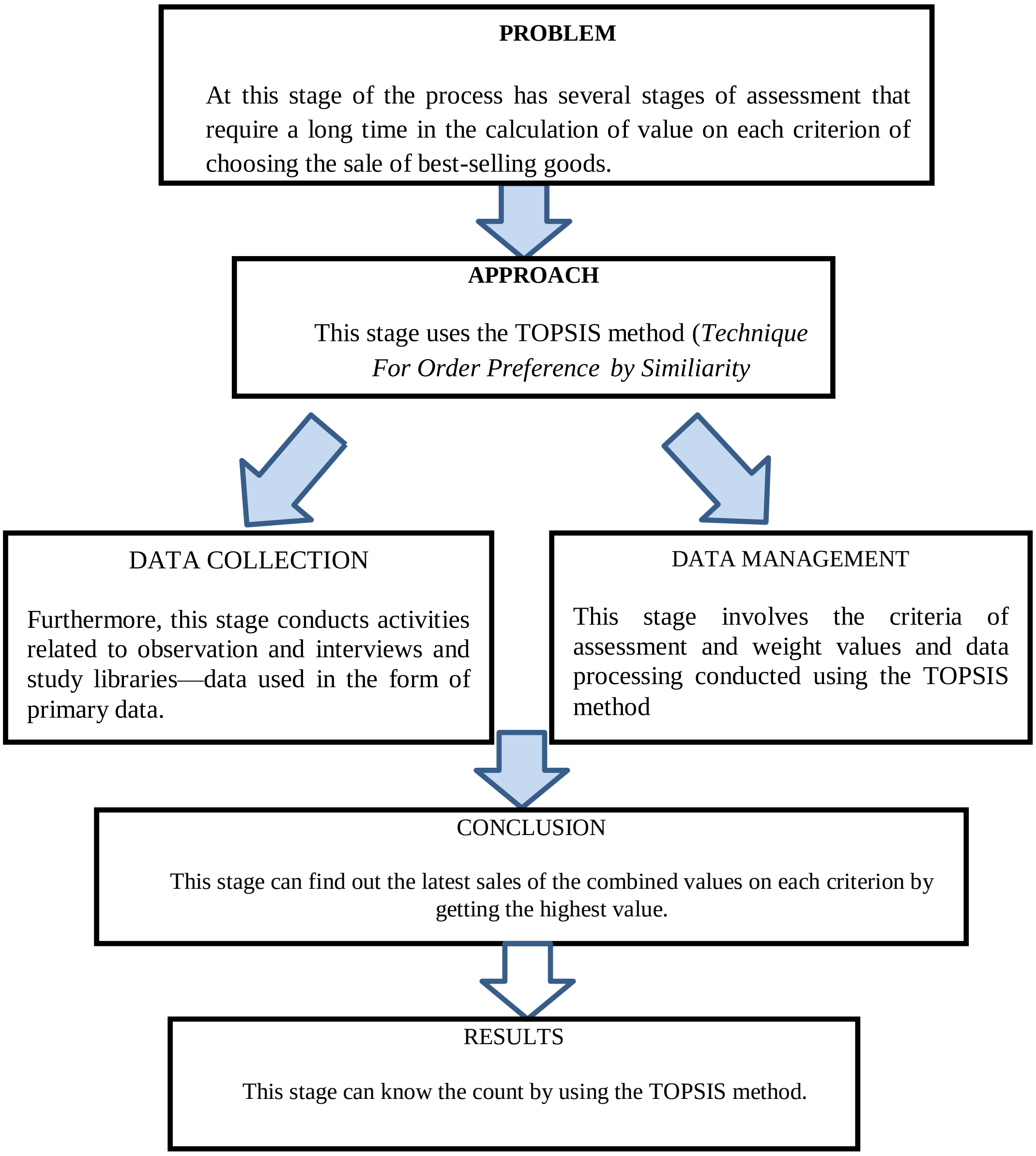
The topsis method is used because it considers the ideal solution positive and the ideal solution negative. In other words, in each attribute on its criteria will be selected the best value to define the value on the positive ideal solution, and vice versa in each attribute on its criteria will also be selected the worst value to define the value on the negative ideal solution. Then it will eventually compare the values on the positive ideal solution and the value on the negative ideal solution. This assessment is expected to help produce objective recommendations (Gunawan, 2020)). The TOPSIS method is also widely used because the method is simple, easy

*Name of the corresponding author

to understand, computationally efficient and has the ability to measure the performance of decision alternatives in a simple mathematical form (Nuris, 2017). The Topsis method is widely used for some research that requires which solution is the best of several options such as robusta coffee bean selection decision support system that is worth export quality (Borman et al., 2020), employee recruitment decision making (et al., 2020), bonsai plant selection (Vista et al., 2020), best supplier (Yusnaeni & Ningsih, 2019)and many other researchers that can be used with Topsis method.

METHOD

The stages to be performed in this study can be described in the following chart :



Data Collection Method

At this stage, the author collects data using two types of data as follows:

1. Primary Data

   The methods used to obtain primary data are as follows:

   a. This observation is done directly to see or observe what is in the research object

   b. Interview directly to the Purchase department at PT. Mahadana Wikasita.

*Name of the corresponding author

SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA
Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 6, Number 1, October 2021
DOI : https://doi.org/10.33395/sinkron.v6i1.10898
e-ISSN : 2541-2019
p-ISSN : 2541-044X

2. Secondary Data
The authors collected data obtained through books and journals related to problems in the selection of bestseller sales.

Population and sample
The author carried out the stages of data collection to be carried out by using primary data, namely by means of observation and interviews, with the aim of getting the population and sample to be studied.

1. Population
   Population stages used all sales for one year that is at PT. Mahadana Wikasita. Because the population is 28 items, it is possible to determine the sample.
2. Sample
   The sample stage used by the author is part of the population that represents the data that has been taken from PT. Mahadana Wikasita. To determine the sample using the Slovin formula to calculate the minimum number of samples (Hadi, 2017).

$$n = \frac{N}{1+Ne^2} \qquad (1)$$

Description:
n = Number of Samples
N = Number of Populations
e = Acceptable sampling error rate

to obtain sample results from population data totaling 28 employees using an error rate of 10% is :
n = 28/(1+(28 x $0,1^2$)
n = 28/(1+(28 x 0,01)
n = 28/ (1+ 0,28)
n = 28/1,28
n = 21, 8. Or rounded up a sample of 22 items

Data Processing
Processing data from the results of research where the data processing uses several steps, namely :

1. Determine the criteria and weight rating on the problem in selecting the best-selling item.
2. Calculations in data processing will be performed using the TOPSIS method. The stages are as follows: (Diana, 2018)
   a. Step 1: Generalizing the alternatives
   b. Step 2: Appreciate, create a Weights table.
   c. Step 3: Weight each criterion
   d. Step 4: Make a normalized decision
   The formula is normalized: $\frac{(Data)}{(the\ root\ of\ the\ rank\ of\ the\ per\ criteria)}$
   e. Step 5: Creating a Weighted Normalization
   Formula : (Normalization data) × (Criteria weights)
   f. Step 6: Find Max and Min of Weighted Normalization
   g. Step 7: Find D + D- in each Alternative
   1. Search formula D+: $Dx+ = \sqrt{(AxC1 - Y1+)^2 + (AxC1 - Y2+)^2 + \cdots + (AxCn - Yn+)^2}$
   2. Search formula D-: $Dx- = \sqrt{(AxC1 - Y1-)^2 + (AxC1 - Y2-)^2 + \cdots + (AxCn - Yn-)^2}$

   Description :
   Di+ = Ai alternative distance with positive ideal solution
   Yj+ = Positive ideal solution [i]
   Yij = Normalization matrix [i][j]
   Di- = Ai alternative distance with negative ideal solution
   Yj- = Negative ideal solution [i]

   h. Step 8: Finding V / Result
   - Search formula V : $Vx = \frac{Dx-}{(Dx-)+(Dx+)}$
   Description :

*Name of the corresponding author

SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA
Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 6, Number 1, October 2021
DOI : https://doi.org/10.33395/sinkron.v6i1.10898
e-ISSN : 2541-2019
p-ISSN : 2541-044X

i = 1,2,....m
Vx = Proximity of each alternative to the ideal solution
Dx+ = Ai alternative distance with positive ideal solution
Di- = Ai alternative distance with negative ideal solution

RESULT

Take steps in processing the data that has been collected by the researcher into an optimal alternative from a number of alternatives with certain criteria using the *Technique For Order Preference bySimiliarity to Ideal Solution* (TOPSIS) method. The steps for solving problems using the TOPSIS method are:

Normalizing Existing Alternatives.

Table 1. Sample Data

No	Code	Name of goods	Criteria			
			Price	Type	Quality	Customer Interest
1	KB1	Pinter Cashier Mobile Bluetooth P5802I	70	90	70	80
2	KB2	Pinter Cashier Mobile Bluetooth MP-58MR	100	80	70	70
3	KB3	Pinter Cashier Mobile Bluetooth P58I	80	80	90	80
4	KB4	Pinter Cashier POS Sano P80VE Thermal Ethernet	90	80	90	90
5	KB5	Pinter Cashier Zonerich AB-PD580	100	90	70	60
6	KB6	Pinter Cashier POS Epson TM-U220D	90	90	70	70
7	KB7	Cashier Drawer Cash Drawer Mini Sano CD330	80	80	80	90
8	KB8	Magnetic Stripe Reader Sano MR600	60	70	70	90
9	KB9	Cashier Drawer Cash Drawer Mini Alto CMA270	70	60	60	70
10	KB10	Cashier Drawer Cash Drawer Janz CS270	70	90	70	70
11	KB11	Kios Pakmo mobile cashier application package android	100	90	90	90
12	KB12	Customer Display Sano CD230	100	70	90	70
13	KB13	Barcode Scanner Alto 7810 - Black	90	60	90	90
14	KB14	Barcode Scanner Bluetooth Sano LS100B	80	60	90	90
15	KB15	Barcode Scanner Sano BS777BT Bluetooth	70	70	90	70
16	KB16	Barcode Scanner Bluetooth Sano LS200B 2D	60	80	90	70
17	KB17	Barcode Scanner Bluetooth Sano LS201B 2 Dimensi	90	98	70	60
18	KB18	Barcode Scanner Honeywell Eclipse MK-5145	80	90	90	60
19	KB19	Barcode Scanner Sano LS820 2 Dimensi	70	87	70	60
20	KB20	Scanner Barcode Zebra Symbol Ls2208	100	70	90	60
21	KB21	Printer Barcode Brother PT-E110 TZe	60	80	60	90
22	KB22	Printer Barcode Brother PT-P300BT	70	70	80	90

The data table above is some of the data that has been taken from all existing data in the company to be used as sample data. And this table also describes the sample data of sales of goods that have been normalized.

Table 2. Assessment Criteria

Sub Aspects	Criteria
Price	C1
Type	C2
Quality	C3

*Name of the corresponding author

SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA
Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 6, Number 1, October 2021
DOI : https://doi.org/10.33395/sinkron.v6i1.10898
e-ISSN : 2541-2019
p-ISSN : 2541-044X

Customer Interest	C4

The table above describes the existing assessment criteria for companies that are used as a reference for evaluating the best-selling goods sales.

Creating Weighted Table.

Table 3. Weight Criteria

Predicate	Weight of Interest
Very unimportant	10%
Not important	15%
Enough	20%
Important	25%
Very important	30%

The table above is a weight value criterion that serves to measure predetermined criteria.

Weighting Each Criterion.

Table 4. Weight Value

Sub Aspects	Criteria	Information	Weight Value
Price	C1	Very important	0.3
Type	C2	Enough	0.2
Quality	C3	Very important	0.3
Customer Interest	C4	Enough	0.2

This table is the result that has been obtained from the weight value criteria that have been set by the company and is sourced from previous research references.

Creating a Normalized Decision Matrix.

In determining a normalized decision matrix, the value of each criterion (X_ij) for all alternatives is added up then the value of each criterion is divided by the number of criteria.

At this stage, to simplify the calculation process, the initial calculation is carried out, looking for the root power of the value of each criterion.

Normalized decision matrix calculation for price criteria

$$R_{11} = \frac{X_{11}}{\sqrt{X_{11}{}^2+X_{21}{}^2+X_{31}{}^2+X_{41}{}^2+X_{51}{}^2+X_{61}{}^2+X_{71}{}^2+X_{81}{}^2+X_{91}{}^2+X_{101}{}^2+\cdots n}} \quad (2)$$

$$|X1| = \sqrt{\begin{array}{c}(70)^2+(100)^2+(80)^2+(90)^2+\\(100)^2+(90)^2+(80)^2+(60)^2+\\(70)^2+(70)^2+(100)^2+(100)^2+\\(90)^2+(80)^2+(70)^2+(60)^2+\\(90)^2+(80)^2+(70)^2+(100)^2+\\(60)^2+(70)^2\end{array}} = 384{,}968$$

Information:
For the search for R_11 on the criteria Average value, that is, the value of each alternative in the price criterion (C1) is divided from the root of the rank obtained for the price criterion (C1). Then the value of 70 is obtained from Alternative 1 on the price criteria (C1) and the value 384,968, which is the result of the root power and so on until the 22nd alternative or the last alternative.

*Name of the corresponding author

SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA
Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 6, Number 1, October 2021
DOI : https://doi.org/10.33395/sinkron.v6i1.10898
e-ISSN : 2541-2019
p-ISSN : 2541-044X

$$r_{11} = \frac{X_{11}}{X_1} = \frac{70}{384,968} = 0,182$$
$$r_{21} = \frac{X_{21}}{X_1} = \frac{100}{384,968} = 0,260$$
$$r_{31} = \frac{X_{31}}{X_1} = \frac{80}{384,968} = 0,208$$
$$r_{41} = \frac{X_{41}}{X_1} = \frac{90}{384,968} = 0,234$$
$$r_{51} = \frac{X_{51}}{X_1} = \frac{100}{384,968} = 0,260$$

From the calculation results determine a normalized decision on each of the existing criteria (X_ij), it can be seen from the results of the matrix contained in the table below.

Table 5. Table Normalized Decision Matrix

No	Price	Type	Quality	Customer Interest
1	0.182	0.241	0.187	0.222
2	0.260	0.214	0.187	0.194
3	0.208	0.214	0.240	0.222
4	0.234	0.214	0.240	0.250
5	0.260	0.241	0.187	0.166
6	0.234	0.241	0.187	0.194
7	0.208	0.214	0.214	0.250
8	0.156	0.187	0.187	0.250
9	0.182	0.161	0.160	0.194
10	0.182	0.241	0.187	0.194
11	0.260	0.241	0.240	0.250
12	0.260	0.187	0.240	0.194
13	0.234	0.161	0.240	0.250
14	0.208	0.161	0.240	0.250
15	0.182	0.187	0.240	0.194
16	0.156	0.214	0.240	0.194
17	0.234	0.262	0.187	0.166
18	0.208	0.241	0.240	0.166
19	0.182	0.233	0.187	0.166
20	0.260	0.187	0.240	0.166
21	0.156	0.214	0.160	0.250
22	0.182	0.187	0.214	0.250

Creating a V Weighted Normalization Decision Matrix

Furthermore, calculating the V normalized process, where each alternative is taken based on the value of the weight value criteria multiplied by the normalization result criteria.

The formula for the value of the V weighted normalized decision matrix is taken based on:

*Name of the corresponding author

SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA
Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 6, Number 1, October 2021
DOI : https://doi.org/10.33395/sinkron.v6i1.10898
e-ISSN : 2541-2019
p-ISSN : 2541-044X

$$Vij = Wi \, . rij \qquad (3)$$

with i= 1,2....,m; and j =1,2,.....n.
Where :
V_{ij} = The elements of the normalized decision matrix are weighted V
W_i = The weights of the j-criteria
r_{ij} = Normalized decision matrix element R.

Calculation Determines V-weighted Normalized for price criteria.

To determine the weighted normalized criterion of average value, then the value of 0.3 is the weight of the price criterion (C1), that is, with the information that this criterion is very important, and the value of 0.182 is obtained from the 1st alternative in the calculation of normalized decisions and so on until the calculation the 22nd alternative.

V1.1 = W1 . R11 = 0,3 X 0,182 = 0,055
V2.1 = W1. R21 = 0,3 X 0,260 = 0,078
V3.1 = W1 . R31 = 0,3 X 0,208 = 0,062
V4 .1 = W1 . R41 = 0,3 X 0,234 = 0,070
V5.1 = W1 . R51 = 0,3 X 0,260 = 0,078

From the results of the weighted normalization calculations that have been carried out, it can be seen in table 6, which is the combined result of each criterion.

Table 6. Weighted Normalized Matrix Table V

No	Price	Type	Quality	Customer Interest
1	0.055	0.048	0.056	0.044
2	0.078	0.043	0.056	0.039
3	0.062	0.043	0.072	0.044
4	0.070	0.043	0.072	0.050
5	0.078	0.048	0.056	0.033
6	0.070	0.048	0.056	0.039
7	0.062	0.043	0.064	0.050
8	0.047	0.037	0.056	0.050
9	0.055	0.032	0.048	0.039
10	0.055	0.048	0.056	0.039
11	0.078	0.048	0.072	0.050
12	0.078	0.037	0.072	0.039
13	0.070	0.032	0.072	0.050
14	0.062	0.032	0.072	0.050
15	0.055	0.037	0.072	0.039
16	0.047	0.043	0.072	0.039
17	0.070	0.052	0.056	0.033
18	0.062	0.048	0.072	0.033
19	0.055	0.047	0.056	0.033
20	0.078	0.037	0.072	0.033
21	0.047	0.043	0.048	0.050
22	0.055	0.037	0.064	0.050

Finding the ideal solution positive A + and ideal solution negative A-

*Name of the corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 6, Number 1, October 2021
DOI : https://doi.org/10.33395/sinkron.v6i1.10898
e-ISSN : 2541-2019
p-ISSN : 2541-044X

$$A^{+} = (y1^{+}, y2^{+} \ldots\ldots yn^{+} \quad (4)$$
$$A^{-} = (y1^{-}, y2^{-} \ldots\ldots yn^{-} \quad (5)$$

Where :
V_j = maxY_{ij}, if j is Benefit (bigger scolding the better)
Min $Y_{ij,}$ if j is Cost (the smaller, the better)

Calculation of A + Positive Ideal Solution and Negative Ideal Solution A$^-$

From the results that can be seen in table IV.6, the combined results for determining the ideal negative and positive ideal solutions are shown in the table below.

Table 7. Table of Positive Ideal Solutions and Negative Ideal Solutions

Ideal Solution	Price	Type	Quality	Customer Interest
A+	0.078	0.052	0.072	0.050
A-	0.047	0.032	0.048	0.033

Seeking a Weighted Normalization of Each Ai Alternative With a Positive Ideal Solution Di^{+} and Negative Ideal Solutions D_i^{-}

$$D_i^{+} = \sqrt{\Sigma_j^n = 1\left(y_{ij} - y_j^{+}\right)^2}; \quad (6)$$
$$D_i^{-} = \sqrt{\Sigma_j^n = 1\left(y_{ij} - y_j^{-}\right)^2}; \quad (7)$$

Where :
D_i^+ = The alternative distance Ai with the ideal solution is positive
Y_j^+ = Positive ideal solution [i]
Y_{ij} = Normalization matrix [i][j]
D_i^- = The alternative distance Ai with the ideal solution is negative
Y_j^- = Negative ideal solution [i]

Weighted calculation of the Positive Ideal Solution D$^+$

The values of 0.078, 0.052, 0.072, and 0.050 are obtained from positive ideal results (A ^ +) on the criteria C1, C2, C3 and C4 and the values of 0.055, 0.048, 0.056 and 0.044 are the values obtained from the weighted normalized calculation results in alternative 1 from criteria C1, C2, C3, and C4 until the count on the 22nd alternative.

$$D_1^{+} = \sqrt{\begin{matrix}(0{,}078 - 0{,}055)^2 + \\ (0{,}052 - 0{,}048)^2 + \\ (0{,}072 - 0{,}056)^2 + \\ (0{,}050 - 0{,}044)^2\end{matrix}} = 0{,}029$$

Weighted Calculation Ai with Negative Ideal Solution D$^-$

The values of 0.047, 0.032, 0.048, and 0.033 are obtained from positive ideal results (A ^ -) on the criteria C1, C2, C3 and C4 and the values of 0.055, 0.048, 0.056 and 0.044 are the values obtained from the weighted normalized calculation results in alternative 1 of criteria C1, C2, C3, and C4 until the count on the 22nd alternative.

$$D_1^{-} = \sqrt{\begin{matrix}(0{,}047 - 0{,}055)^2 + \\ (0{,}032 - 0{,}048)^2 + \\ (0{,}048 - 0{,}056)^2 + \\ (0{,}033 - 0{,}044)^2\end{matrix}} = 0{,}022$$

The results that have been obtained from the above calculations can be concluded to be the result of a positive ideal weighted calculation (D +) and a negative ideal weighted result (D-) as described in the table below.

*Name of the corresponding author

SinkrOn
JURNAL & PENELITIAN TEKNIK INFORMATIKA
Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 6, Number 1, October 2021
DOI : https://doi.org/10.33395/sinkron.v6i1.10898
e-ISSN : 2541-2019
p-ISSN : 2541-044X

Table 8. Weighted Calculation Results D^+ and D^-

No	Name of goods	D+	D-
1	Pinter Cashier Mobile Bluetooth P5802I	0.029	0.022
2	Pinter Cashier Mobile Bluetooth MP-58MR	0.021	0.034
3	Pinter Cashier Mobile Bluetooth P58I	0.019	0.032
4	Pinter Cashier POS Sano P80VE Thermal Ethernet	0.012	0.039
5	Pinter Cashier Zonerich AB-PD580	0.024	0.036
6	Pinter Cashier POS Epson TM-U220D	0.021	0.030
7	Cashier Drawer Cash Drawer Mini Sano CD330	0.020	0.030
8	Magnetic Stripe Reader Sano MR600	0.038	0.019
9	Cashier Drawer Cash Drawer Mini Alto CMA270	0.040	0.010
10	Cashier Drawer Cash Drawer Janz CS270	0.030	0.020
11	Kios Pakmo mobile cashier application package android	0.004	0.046
12	Customer Display Sano CD230	0.019	0.040
13	Barcode Scanner Alto 7810 - Black	0.022	0.037
14	Barcode Scanner Bluetooth Sano LS100B	0.026	0.033
15	Barcode Scanner Sano BS777BT Bluetooth	0.030	0.026
16	Barcode Scanner Bluetooth Sano LS200B 2D	0.034	0.027
17	Barcode Scanner Bluetooth Sano LS201B 2 Dimensi	0.025	0.032
18	Barcode Scanner Honeywell Eclipse MK-5145	0.024	0.033
19	Barcode Scanner Sano LS820 2 Dimensi	0.033	0.019
20	Scanner Barcode Zebra Symbol Ls2208	0.023	0.040
21	Printer Barcode Brother PT-E110 TZe	0.040	0.020
22	Printer Barcode Brother PT-P300BT	0.029	0.025

Finding the Preference Value for the Result of Each Alternative (V_i)

$$V_i = \frac{D_i^-}{D_i^- + D_i^+} \qquad (8)$$

i = 1,2,....m
Vi = The proximity of each alternative to the ideal solution
D_i^+ = The alternative distance Ai with the ideal solution is positive
D_i^- = The alternative distance Ai with the ideal solution is negative
A larger Vi value indicates that the alternative Ai is preferred.

The calculation of the preference value for each alternative (V_i)

The value of 0.022 is the value in alternative 1 obtained from the negative ideal weighted result (D^-) and the value of 0.029 is a positive weighted result (D^+) which is also the value of the alternative 1 onwards until the alternative 22 for the value (D^+) and (D^-) can be seen in table 8.

$$V_1 = \frac{0{,}022}{0{,}022 + 0{,}029} = \frac{0{,}022}{0{,}051} = 0{,}431$$

*Name of the corresponding author

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 6, Number 1, October 2021
DOI : https://doi.org/10.33395/sinkron.v6i1.10898
e-ISSN : 2541-2019
p-ISSN : 2541-044X

In the table below, it explains that table IV.9 is the calculation results obtained from the above calculations, which are the final results that have been obtained at all calculation stages, namely the calculation of the preference value from the alternative serial number 1 to 22 in the entire data sample sales of goods.

Table 9. Preference Value For Each Alternative (V_i)

Name	Vi
Pinter Cashier Mobile Bluetooth P5802I	0.431
Pinter Cashier Mobile Bluetooth MP-58MR	0.618
Pinter Cashier Mobile Bluetooth P58I	0.627
Pinter Cashier POS Sano P80VE Thermal Ethernet	0.765
Pinter Cashier Zonerich AB-PD580	0.600
Pinter Cashier POS Epson TM-U220D	0.588
Cashier Drawer Cash Drawer Mini Sano CD330	0.600
Magnetic Stripe Reader Sano MR600	0.333
Cashier Drawer Cash Drawer Mini Alto CMA270	0.200
Cashier Drawer Cash Drawer Janz CS270	0.400
Kios Pakmo mobile cashier application package android	0.920
Customer Display Sano CD230	0.678
Barcode Scanner Alto 7810 - Black	0.627
Barcode Scanner Bluetooth Sano LS100B	0.559
Barcode Scanner Sano BS777BT Bluetooth	0.464
Barcode Scanner Bluetooth Sano LS200B 2D	0.443
Barcode Scanner Bluetooth Sano LS201B 2 Dimensi	0.561
Barcode Scanner Honeywell Eclipse MK-5145	0.579
Barcode Scanner Sano LS820 2 Dimensi	0.365
Scanner Barcode Zebra Symbol Ls2208	0.635
Printer Barcode Brother PT-E110 TZe	0.333
Printer Barcode Brother PT-P300BT	0.463

DISCUSSION

From the results of table 9, it is the result of preference from the sequence of alternative numbers 1 to 22, and to find out the order that gets the largest to the smallest preference value can be seen in the table below.

Table 10. Preference Value Of Largest Order (V_i)

No	Name	Result
1	Pinter Cashier Mobile Bluetooth P5802I	17
2	Pinter Cashier Mobile Bluetooth MP-58MR	7
3	Pinter Cashier Mobile Bluetooth P58I	5
4	Pinter Cashier POS Sano P80VE Thermal Ethernet	2
5	Pinter Cashier Zonerich AB-PD580	8
6	Pinter Cashier POS Epson TM-U220D	10
7	Cashier Drawer Cash Drawer Mini Sano CD330	8
8	Magnetic Stripe Reader Sano MR600	20
9	Cashier Drawer Cash Drawer Mini Alto CMA270	22

Sinkron : Jurnal dan Penelitian Teknik Informatika
Volume 6, Number 1, October 2021
DOI : https://doi.org/10.33395/sinkron.v6i1.10898
e-ISSN : 2541-2019
p-ISSN : 2541-044X

10	Cashier Drawer Cash Drawer Janz CS270	18
11	Paket aplikasi kasir mobile android Kios Pakmo	1
12	Customer Display Sano CD230	3
13	Barcode Scanner Alto 7810 - Black	5
14	Barcode Scanner Bluetooth Sano LS100B	13
15	Barcode Scanner Sano BS777BT Bluetooth	14
16	Barcode Scanner Bluetooth Sano LS200B 2D	16
17	Barcode Scanner Bluetooth Sano LS201B 2 Dimensi	12
18	Barcode Scanner Honeywell Eclipse MK-5145	11
19	Barcode Scanner Sano LS820 2 Dimensi	19
20	Scanner Barcode Zebra Symbol Ls2208	4
21	Printer Barcode Brother PT-E110 TZe	20
22	Printer Barcode Brother PT-P300BT	15

The results that have been obtained from the calculation stages that have been carried out can be seen that the acquisition of the highest total preference value is the Kios Pakmo android mobile cashier application package with a value of 0.92

CONCLUSION

Based on the research conducted by the author, from 22 samples of the most sale POS Cashier machine stuff and tools, it can be concluded that the highest value is the Kios Pakmo android mobile cashier application package with a value of 0.920 which can be interpreted as the best-selling sales for one year and that means there is a sales relationship. Best-selling items using the TOPSIS method.

REFERENCES

Ariandi, V., Hadi, F., & Irawan, D. (2018). Sistem Pendukung Keputusan Dalam Penentuan Suku Cadang Yang Laris Pada Kharisma Motor Dengan Metoda Topsis Dan Bordadi. *Jurnal KomTekInfo*, *5*(1), 11–22.

Benning, B. A., Astuti, I. F., & Khairina, D. M. (2015). Sistem Pendukung Keputusan Pembelian Perangkat Komputer Dengan Metode Topsis (Studi Kasus: Cv. Triad). *Informatika Mulawarman : Jurnal Ilmiah Ilmu Komputer*, *10*(2), 1. https://doi.org/10.30872/jim.v10i2.183

Borman, R. I., Megawaty, D. A., & Attohiroh, A. (2020). Implementasi Metode TOPSIS Pada Sistem Pendukung Keputusan Pemilihan Biji Kopi Robusta Yang Bernilai Mutu Ekspor (Studi Kasus : PT. Indo Cafco Fajar Bulan Lampung). *Fountain of Informatics Journal*, *5*(1), 14. https://doi.org/10.21111/fij.v5i1.3828

Gunawan, C. (2020). Penerapan Metode TOPSIS untuk Pengangkatan Karyawan Kontrak Menjadi Karyawan Tetap (Studi Kasus: PT Hanuraba Sawit Kencana). *JIKO (Jurnal Informatika Dan Komputer)*, *3*(1), 42–50. https://doi.org/10.33387/jiko.v3i1.1722

Hia, P., Hardianto, & Destari, R. A. (2018). *Sistem pendukung keputusan menentukan kenaikan kelas dengan menggunakan metode topsis pada smk yapim mabar*. *11*(2), 171–181.

Kurnia, V. A., Erianda, A., & Meidelfi, D. (2020). Perancangan Website untuk Menentukan Produk Paling Banyak Terjual di Bengkel Man Motor Metode TOPSIS. *Ultima*, *XI*(2), 125–129.

Murti, T., Abdillah, L. A., Sobri, M., Erlangga, D., Wijayanti, I. A., Ragestu, F. D., Sibarani, A. J. P., & Khaironi, M. (2020). Pemilihan Mie Terlaris Pada Toko Aisyah dengan Metode VIKOR (VIšekriterijumsko Ko mpromisno Rangiranje). *Jurnal Golden Age*, *9*(115), 9–15.

Muzakkir, I. (2017). Penerapan Metode Topsis Untuk Sistem Pendukung Keputusan Penentuan Keluarga Miskin Pada Desa Panca Karsa Ii. *ILKOM Jurnal Ilmiah*, *9*(3), 274–281. https://doi.org/10.33096/ilkom.v9i3.156.274-281

Nuris, N. (2017). Sistem Keputusan Metode Saw Dan Topsis Untuk Pemilihan Staff Peduli Laka Studi Kasus: Pt Express Pool Cipayung. *Evolusi : Jurnal Sains Dan Manajemen*, *5*(2), 59–65. https://doi.org/10.31294/evolusi.v5i2.2599

Sanyoto, G. P., Handayani, R. I., & Widanengsih, E. (2017). Sistem Pendukung Keputusan Pemilihan Laptop Untuk Kebutuhan Operasional Dengan Metode AHP (Studi Kasus: Direktorat Pembinaan Kursus Dan Pelatihan Kemdikbud). *Jurnal Pilar Nusa Mandiri*, *13*(2), 167–174.

Sefrika, S. S. (2018). Sistem Pendukung Keputusan Untuk Pemilihan Kendaraan Mobil Keluarga Dengan Metode Topsis. *Jurnal Teknologi Informasi MURA*, *10*(2), 69. https://doi.org/10.32767/jti.v10i2.356

*Name of the corresponding author

Sriani, & Putri, R. A. (2018). Analisa Sistem Pendukung Keputusan Mengunakan Metode TOPSIS Untuk Sistem Penerimaan Pegawai Pada SMA Al Washliyah Tanjung Morawa. *Jurnal Ilmu Komputer Dan Informatika*, *02*(April), 40–46.

Vista, E., Dolok, B., Marbun, M., & Informatika, T. (2020). *Penerapan Metode Topsis Pada Sistem Pendukung*. *4*(1), 49–53.

Wibisono, G., Amrulloh, A., & Ujianto, E. (2019). Penerapan Metode Topsis Dalam Penentuan Dosen Terbaik. *ILKOM Jurnal Ilmiah*, *11*(2), 102–109. https://doi.org/10.33096/ilkom.v11i2.430.102-109

Yusnaeni, W., & Ningsih, R. (2019). Analisa Perbandingan Metode Topsis, Saw Dan Wp Melalui Uji Sensitifitas Untuk Menentukan Pemilihan Supplier. *Jurnal Informatika*, *6*(1), 9–17. https://doi.org/10.31311/ji.v6i1.4399

*Name of the corresponding author