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Implementation of FMADM Method with AHP and SAW Algorithm Collaboration to Determine the Best-Selling Interest Category (Case Study CV Usaha Sahabat)

Irfan Aldiansyah[1*], Wawan Gunawan[2]
[1,2] Universitas Mercu Buana, West Jakarta, Indonesia

(*) Corresponden Author: 41518010019@student.mercubuana.ac.id

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Abstract

In the era of digitalization of CV Usaha Sahabat wants to transform to develop its company. There are several things experienced on CV Usaha Sahabat in conducting sales analysis based on the best-selling flower category, so that it has not been able to increase the number of sales for certain products. CV Usaha Sahabat wants to make a decision on which product to sell in the flower bouquet category that sells best. The main thing of this study is to implement the FMADM (Fuzzy Multiple Attribute Decision Making) method in a web-based decision support system to solve problems in decision-making. This study uses a collaboration between the AHP (Analytical Hierarchy Process) algorithm to determine a Criteria weight that has 4 criteria in the form of the number of transactions, price, size, and sessional with the SAW (Simple Additive Weighting) algorithm to determine the final result of preferences in a web-based decision support system for making a decision in the analysis of sales data as an alternative whose content is in the form of a flower bouquet category. The development of this web system was built by utilizing the CI (CodeIgniter) framework with PHP, HTML, CSS, and mysql programming for the database management system. The results of the study will show a preference for decision-making in the best-selling flower bouquet category product and a result of the creation of a decision support system (SPK). The final result of the preference value of this flower category is shown in the Grief Bouquet with a preference value of 0.86. The results of this study are that the proposed web-based decision support system can help CV Usaha Sahabat for making a decision on the sales analysis of the best-selling bouquet products to increase the sales of their products.

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INTRODUCTION

In today's modern era, many companies want to transform [1] to develop their companies by digitizing or applying technology to the company itself [2]. CV Usaha Sahabat has currently digitized or implemented a website-based application technology to carry out flower bouquet sales operations. However, currently CV Usaha Sahabat has

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difficulty analyzing sales based on the large amount of transaction data in the best-selling interest category, so it has not been able to increase the number of sales of certain products. In this phenomenon, CV Usaha Sahabat finds it difficult to make decisions in analyzing data which is required to create a decision support system (SPK) in analyzing their sales transaction data to find out the best-selling interest category. This decision-making can later increase product sales from the results of decisions in the future.

There are several related studies related to the decision support system, including PT Ardhi Karya Teknik The company does not have the right system for the selection of machines so that production results are in accordance with needs. Then the results researched by Rusmawan from the research made a desktop-based SPK by applying the SAW algorithm to determine the choice of goods or production machines to be purchased from the criteria of price, number of production, number of operators, and completeness which resulted in the name of the product, namely product 4 with a value of 1. [3].

Another study applied SPK using the FMADM method and applied the SAW algorithm which can provide assessment and calculation decisions in intensive employee provision and assess the best employees efficiently from the criteria of attendance, achievement, and length of work, where the highest score of 23 was found in the alternatives of Yuda Aditya, Ubaidillah, and Puji Susanto [5]. Another research is the application of the SAW Method in determining outstanding education personnel based on 6 criteria whose results succeeded in creating a decision support system with a value of 4.67 on an alternative called Febrianti, SP [6]. There is also another related research, namely the implementation of the Analytical Hierarchy Process (Ahp) to determine outstanding lecturers based on the tridharma of higher education based on 3 criteria with the results of an SPK application whose result is the largest ranking value of 0.9343 on an alternative named Anita Andriani, S.Si., M.Sc [10]. Another related research is the selection of new employees using the Ahp (Analytic Hierarchy Process) method which is based on 4 criteria whose research results are in the form of a web-based new employee selection system application whose highest score results were obtained by the applicant Agus Pradana Pambudi with a value of 0.26 [11].

The author wants to create a website-based SPK application for CV Usaha Sahabat in order to make decisions about the selection of the best-selling flower bouquet category, then the determination of criteria will be determined by the company to be applied to the application. The company chooses 4 criteria, namely from the number of transactions, selling price, size, and sessional.

In this study, the author will apply the implementation of the FMADM method with the collaboration of the AHP algorithm to determine a weight of criteria and the SAW algorithm for analysis that produces this ranking or preference value into a website-based application for decision-making of the best-selling flower bouquet category on CV Usaha Sahabat transaction data.

LITERATURE REVIEW

SPK

SPK is created to make important decisions, decision support systems (SPK) can be very helpful in decision-making. Decision support systems are not intended to replace assessment, but rather to enhance it in assisting planners, analysts, and managers in the decision-making process [4].

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Fuzzy Multiple Attribute Decision Making (FMADM)

Simply put, Fuzzy Multiple Attribute Decision Making is a technique for evaluating a large number of options based on the criteria that have been obtained to arrive at the best choice. It is essential to use FMADM to weigh each attribute and then use the ranking process to select the best option [6].

Finding attribute weight values can be done in three ways: subjective, objective, or a combination of both, which we'll discuss here. The advantages and disadvantages of each approach are obvious. It is possible to determine several factors on the alternative ranking process in an independent way in the case of a subjective approach, where the value of weight is determined by the subjective decision-maker. The weighted value is calculated mathematically in the objective approach, whereas the subjectivity of the decision-maker is ignored in the subjective approach to the decision [7].

It is possible to solve FMADM problems using a variety of algorithmic techniques, including:

a) Simple Additive Weighting (SAW)
b) Weighted Product (WP)
c) ELECTRE
d) Technique for Order Preference by Similarity to Ideal Solution (TOPSIS)
e) Analytic Hierarchy Process (AHP) [8].

Analytical Hierarchy Process (AHP)

The AHP algorithm is an algorithm for implementing a decision support system that is different from others. Rather than determining the value of each Criteria at the beginning, the weight of each Criteria is determined by the formula of the current table's priority scale (Intensity of Importance) [9].

The importance of a Criteria is determined by one's point of view when assessing it using this method, which is perceptual [10].

Human perception is the main input of the Analytical Hierarchy Process (AHP) method, which has its own functional hierarchy. Unstructured problems can be broken down into smaller parts and are easy to manage using a hierarchy [11]. Here are the steps of AHP:

1. To start with a specific goal, create a hierarchical structure.
2. Determining the intensity of interest
3. Create a comparison matrix.
4. Define paired comparisons.
5. Calculate the eigenvalue and test consistency.

Index consistency (CI) calculation formula:

$$\mathrm{CI} = (\text{lambda maks} - \mathrm{n})/\mathrm{n} - 1 \quad (1)$$

Where:
- n = number of elements

Formula for Calculating Consistency Ratio (CR):

$$\mathrm{CR} = \mathrm{CI}/\mathrm{IR} \quad (2)$$

Where:
- CR = Consistency Rasio
- CI = Consistency Index

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- IR = Index Random Consistency [9]-[12].

Simple Additive Weighting (SAW)

The term "simple addition weighting" refers to the weighted addition (SAW) method. The performance ratings of each alternative are summed across all attributes, and this is how the SAW method works [13]. At its core, the SAW algorithm relies on weighted performance rankings that are summed for each alternative across all attributes. The SAW method relies on a decision matrix (X) to normalize so that all possible rankings can be compared [14].

The method of calculating SAW has several stages, namely:

1. Analysis Stage
   This stage determines the type of criteria whether the benefits or costs are to be tested.

2. Normalization Stage
   In this step, the type of criteria is considered when converting the value of each attribute to a scale of 0-1. The formula is as follows:
   a. If the Criteria is a benefit attribute
   $$Rij = Xij/Max.\,xij \quad (1)$$
   b. If the Criteria is the cost attribute
   $$Rij = Min.\,xij/xij \quad (2)$$
   Information:
   rij = normalized performance rating value
   xij = the attribute value of each Criteria
   Max xij = the largest value of each Criteria
   Min xij = the smallest value of each Criteria
   benefit = if the greatest value is the best
   cost = if the smallest value is the best where rij is the normalized performance rating of the Ai alternative on the Cj attribute; i=1.2,...,m and j=1.2,...,n.

3. Per-ranking Stage
   Finally, the main stage, which multiplies all the attributes by the weight of each alternative's criteria, is this stage. The formula is as follows:
   $$Vi = \sum wj\ rij \quad (3)$$
   Information:
   Vi = the ranking for each alternative
   wj = the weight value of each Criteria
   rij = normalized performance rating value [15].

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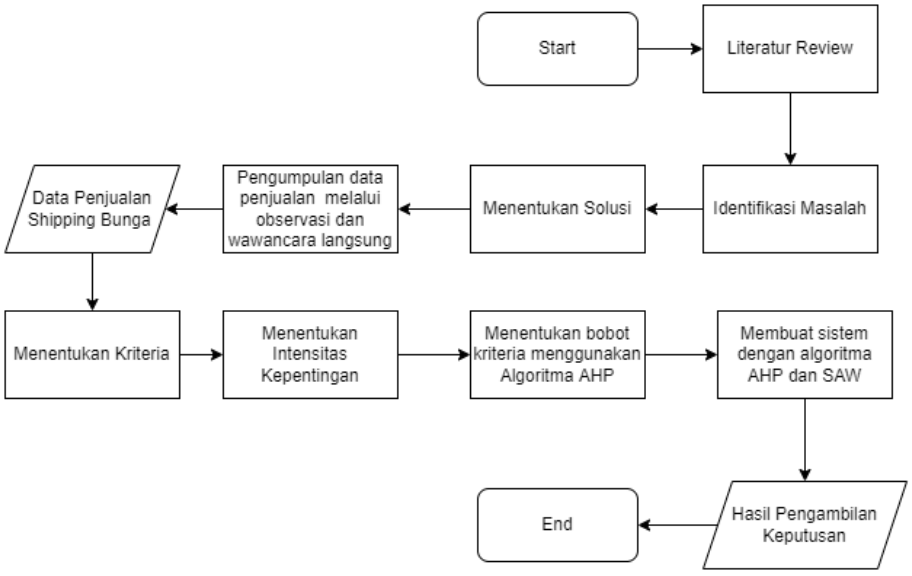
METHODS

Here is the methodology in the case study as Figure 1.

Figure 1. Methodology



This research was carried out in the following stages:

1. Problem Identification
   In this problem, the author has analyzed the problem in CV Usaha Sahabat, namely to determine a decision making on the best-selling flower category.
2. Defining a solution
   The author has determined a solution to help with the problem, namely by creating a website-based application for decision support.
3. Data collection
   At the data collection stage, the author collects interest shipping data by means of observation and interviews with related parties to request data collection from the CV Usaha Sahabat flower sales website database within a period of 3 months which is around 2039 data which will later be used to determine the criteria in the next stage.
4. Define criteria
   After the data is obtained from the data collection stage, then determine the criteria based on the information provided by the company consisting of 4 criteria, namely, the number of transactions, price, size, and sessional. For the complete criteria are shown in Table 1 below:

Table 1. Criteria

Criteria	
Transaction Amount	K1
Selling Price	K2
Size	K3
Sessional	K4

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5. Determining the Intensity of Interest
   After determining the criteria, the author will proceed to determine the intensity of the interest where the author will discuss the company whose content is a Criteria that will later be given importance. The intensity of these interests will be used further to determine the weight. For the full intensity of interest, Table **2** is shown below:

Table 2. Intensity of Interest

The intensity of the company's interests				*Intensity of Interest*		
Criteria	***Value***	***Comparison Remarks***	***Value***	***Criteria***	***Value***	***Information***
Transaction Amount	9	Absolutely important than	1/9	Size	1	Equally Important
Transaction Amount	7	Absolutely important than	1/7	Price	3	A little more important than the others
Transaction Amount	4	Equivalent has more priority	1/4	Sesional	5	More important than anything else
Price	2	Equivalent has enough priority	1/2	Size	7	A little more absolute important than the others
Price	1	Equals are equally important	1/1	Sesional	9	Absolutely important from the rest
Size	1/5	More important than	5	Sesional	2,4,6,8	Values between 2 values that have "consideration" adjacent

6. Determining Weight
   After determining the intensity of interest, we will proceed to determine the weights using the AHP algorithm. Where the AHP algorithm determines by calculating the formula which will later be the result of the calculation of the AHP formula will be used as a weight that will be used to be tested in the SAW algorithm.
7. System Creation
   After all stages have been carried out, the next stage is the creation of a system where the system is in the form of a website-based application to support decisions based on predetermined criteria and weighting which will later be input into the system or application. After that, the preference results will be calculated using the SAW algorithm.

RESULT AND DISCUSSION

A. Analysis and Planning
   1. Use Case
      The following is a view of the use cases of the SPK application that will be created in Figure 2 below:

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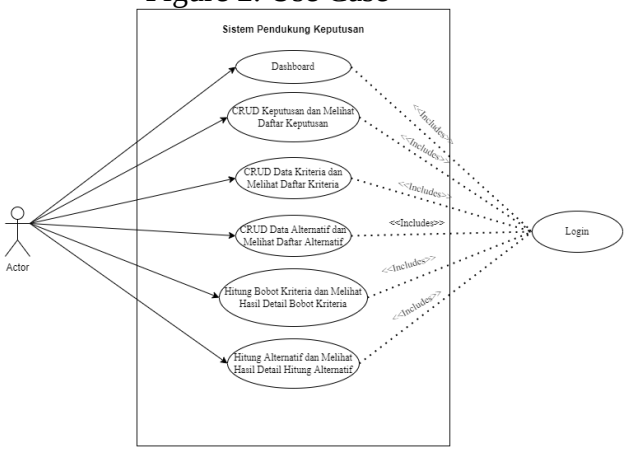
Figure 2. Use Case

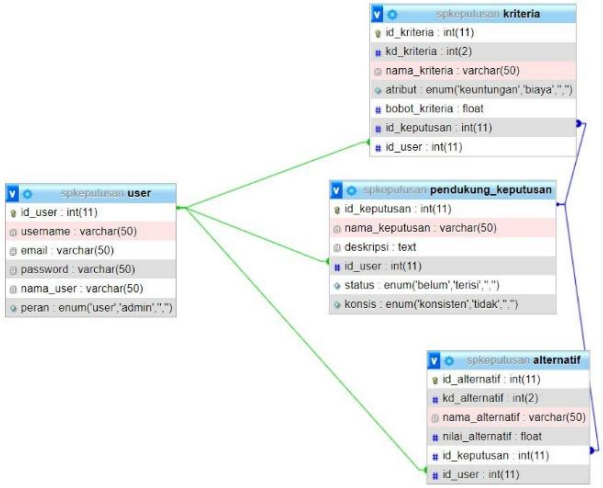


Explanation from Figure 2. Above is the form of a flow diagram in the SPK CV Usaha Sahabat application where this application is only used by 1 user as an actor. The actor can use or access the Dashboard feature in the application, then the actor will be able to Create, Read, Update, Delete on the Decision menu, Criteria Data, Alternative Data. After that, the actor can use the Calculate Weights criteria menu after the data has been completed and the actor can use the Alternative Calculation menu to see the final result and can help to support the decision.

2. ERD

Here is the ERD view of the SPK application in Figure 3 below:

Figure 3. ERD



The explanation of ERD in the image above on the SPK application has 4 entities in the form of Users for user data, Pendukung_keputusan for decision data to be obtained in the form of best-selling interest categories, Criteria for the criteria data used which consist of 4 criteria, namely Number of Transactions, Price, Size, and Sessional, and Alternative for alternative data which is an interest category dataset.

Of the 3 entities such as the decision-supporting entity, criteria, and alternatives, each has a foreign key id_user which is a relationship or liaison

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between the user and the 3 entities, then from 2 entities such as the Criteria and alternative entities has a foreign key id_keputusan which is a relationship or liaison between the pendukung keputusan entity and the 2 entities.

B. Dataset

1. Dataset

The dataset used by the author in this study is CV Usaha Sahabat transaction data from January - February 2022. The dataset analyzed is 2039 records, which is the number of CV Usaha Sahabat transactions.

2. Processing Data

In data processing, the author has processed the data using the excel application. The author processes the only data that is needed, namely Category, Size, Selling Price, and transaction date data with excel feature, namely a pivot table on the dataset which functions to show what categories are in the transaction dataset and can determine the number of transactions from each category, then from each category the author uses the average formula to determine the average price of each interest category which has different price variants as well as for size.

For this transaction_date process, to determine the sales season, the author analyzed by comparing sales data in January with February in the dataset. In January it is the sales season congratulations (Graduation) indicating a value of 0 and February the wedding sales season (Wedding) indicates the value of 1 that will be used in the SPK application is shown in Figure 4. next:

Figure 4. Dataset

Kategori	Jumlah Transaksi	Harga	Ukuran (m)	Sesional
Bloom Box	1	Rp1.000.000,00	0	0
Bunga Meja	53	Rp1.028.028,46	0	1
Hand Bouquet	111	Rp660.140,00	0	1
Karangan Bunga Congratulations	399	Rp702.239,20	2,57	0
Karangan Bunga Dukacita	1025	Rp715.956,76	2,57	1
Karangan Bunga Wedding	403	Rp713.743,40	2,57	1
Standing Flower	47	Rp1.129.982,73	0	1

3. Dataset Conversion

After processing the dataset, the author converts the values of the dataset in Figure 4 to facilitate the input of dataset values into the application. The author will convert the dataset values into 5 sets using the rule composition method.

There are several methods in the use of rule composition, namely Max, Additive, and probabilistic methods [16]. The authors are currently using the Max method because this method is obtained by taking the maximum value of a rule, then using it to modify the dataset area and apply it to the output or conversion result. The composition of the domain rules is based on the rules of experts or the company in the form of Min-Max, Average, and Median rules based on the value of the dataset.

The following is the set and composition of domain rules to find the domain values contained in Table 3 as follows:

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Table 3. Domain Rule Set and Composition

Variable Name	Value	Set	Domain Rule Composition
Transaction Amount	1 - 1025	1. Very Less	Using the dataset value threshold
		2. Less	Using the average value between the sufficient value and the very less value
		3. Enough	Using the median value of the dataset value
		4. Good	Using the average value between the fair and excellent values
		5. Excellent	Using the maximum value of the dataset value
Price	Rp. 660.140 - Rp. 1.129.982	1. Very Less	Using the maximum value of the dataset value
		2. Less	Using the average value between the sufficient value and the very less value
		3. Enough	Using the median value of the dataset value
		4. Good	Using the average value between the fair and excellent values
		5. Excellent	Using the dataset value threshold
Size	0 - 3	1. Very Less	Using the dataset value threshold
		2. Less	Using the average value between the sufficient value and the very less value
		3. Enough	Using the median value of the dataset value
		4. Good	Using the average value between the fair and excellent values
		5. Excellent	Using the Maximum Value of the dataset value
Sessional	0 - 1	3. Enough	Using the dataset value threshold
		5. Excellent	Using the maximum value of the dataset value

The process of using this rule composition aims to find the domain value (ranged) based on the domain rule composition value in column 4 in Table 3. Here is Figure 5 of the results of the domain rule composition process as follows:

Figure 5. Domain Rule Composition Value

Konversi Nilai	Keterangan	Jumlah Transaksi	Harga	Ukuran (m)	Sesional
1	Sangat Kurang	1	Rp1.129.982,73	0	
2	Kurang	146	Rp989.997,83	0,55	
3	Cukup	291	Rp850.012,94	1,10	0
4	Baik	658	Rp755.076,47	1,84	
5	Sangat Baik	1025	Rp660.140,00	3	1

4. Dataset Conversion Result

The results of the Dataset Conversion are obtained from the results of the domain range contained in Table 4 and then applied to the dataset in Figure 4 so that it becomes an output using the maximum value rule of the domain rule composition value. The following is the range domain in Table 4 based on the maximum rule composition value as follows:

Table 1. Domain Range

Conversion Value	Transaction Value	Price	Size	Sessional	Description
1	0-1	Rp 990.000 - Rp 1.129.983	0 – 0,54		Very Less
2	2-146	Rp 851.000 - Rp 989.998	0,55 - 1,09		Less
3	147-291	Rp 756.000 - Rp 850.013	1,10 - 1,83	0	Enough
4	292-658	Rp 661.000 - Rp 755.076	1,84 - 2,99		Good
5	659-1025	Rp 100.000 - Rp 660.140	2,99 - 3	1	Excellent

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Figure 6. Dataset Conversion Result

Kategori	Jumlah Transaksi (ben	Harga (cost)	Ukuran (cost)	Sesional (benefit)
Bloom Box	1	2	1	3
Bunga Meja	2	2	1	5
Hand Bouquet	2	5	1	5
Karangan Bunga Congratulations	4	5	4	3
Karangan Bunga Dukacita	5	5	4	5
Karangan Bunga Wedding	4	5	4	5
Standing Flower	2	1	1	5

C. AHP Test Results

1. Results of the Comparison Matrix

This comparison matrix is to compare the intensity of interest that has been determined in Table 2. The following are the results of the comparison matrix in Table 5 as follows:

Table 5. Comparison Matrix

Comparison Matrix	Transaction Amount	Price	Size	Sessional
Transaction Amount	1,00	7,00	9,00	4,00
Price	0,14	1,00	2,00	1,00
Size	0,11	0,50	1,00	0,20
Sessional	0,25	1,00	5,00	1,00
Total	1,50	9,50	17,00	6,20

2. Eigen, Total, and Mean Value Calculation

To calculate the value of eigen, it is by dividing between each value of the intensity of interest with the result of the number of intensity interest of each Criteria as follows:

Transaction Amount = 1.00/1.50 = 0.66
Price = 0.14/1.50 = 0.09
Size = 0.11/1.50 = 0.07
Sessional = 0.25/1.50 = 0.17, dst

Next, sum the results of the eigenvalue matrix by summing the results of the division above as follows:

Transaction Amount = 0.66+0.74+0.53+0.65 = 2.58
Price = 0.09+0.11+0.12+0.16 = 0.48
Size = 0.07+0.05+0.06+0.03 = 0.22
Sessional = 0.17+0.11+0.29+0.16 = 0.73

Finally, calculate the average value of eigen, where this average value will be used to calculate the consistency value and used as a weight when the consistency value has been proven, here is the calculation of the Average:

Transaction Amount = 2.58/4 = 0.6441
Price = 0.48/4 = 0.1198
Size = 0.22/4 = 0.0544
Sessional = 0.73/4 = 0.1817
Average Amount = 0.6441+0.1198+0.0544+0.1817 =1

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3. Results of Eigen Value

The following is the result of the eigenvalue where when the average value is = 1 then the calculation of the eigenvalue is correct, if ≠ 1 then the calculation of the eigenvalue is wrong. As shown in Table 6 as follows:

Table 6. Eigen Value

Criteria	**Eigen Value**				**Amount**	**Average**
	Transaction Amount	Price	Size	Sessional		
Transaction Amount	0,66	0,74	0,53	0,65	2,58	0,6441
Price	0,09	0,11	0,12	0,16	0,48	0,1198
Size	0,07	0,05	0,06	0,03	0,22	0,0544
Sessional	0,17	0,11	0,29	0,16	0,73	0,1817
Average Amount - Average						1,00

4. Consitency Testing

The following are the results of the index consistency (CI) test with the formula:

$$\mathrm{CI} = \frac{(\lambda\max - \mathrm{n})}{(\mathrm{n} - 1)} \quad (4)$$

Where:

$\lambda \max = \Sigma x/n$

$\lambda\max = (1.50 * 0.6441) + (9.50 * 0.1198) + (17.00 * 0.0544) + (6.20 * 0.1817) = 4.1582$

So, the result of the formula above is the result of the calculation of the maximum lamda where λmax is obtained from the calculation of the multiplication between the total number of comparative matrix values of each Criteria in Table 2 and then multiplied by the average eigenvalue in Table 5 according to the criteria, then added up, it can be stated that the lambda max value is 4.1582.

So, $CI = \frac{4.1582-4}{4-1} = 0.0527$

The following are the results of the consistency ratio (CR) test with the formula:

$$\mathrm{CR} = \frac{\mathrm{CI}}{\mathrm{IR}} \quad (5)$$

$\mathrm{CR} = \frac{0.0527}{0.9} = 0.0586$

So, checking the consistency of the hierarchy, if the value is more than 10%, until the evaluation of judgement information must be improved. But if the consistency ratio (CI/IR is less than equal to 0.1, so the calculation results are declared correct). So the result of the author's CR calculation is 0.0586 which is less than equal to 0.1, then it is declared to be true, consistent.

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D. SAW Test Results

1. Normalization
   - If the Criteria is the benefit attribute: Rij = Xij/Max Xij (1)
   - If the Criteria is the cost attribute: Rij=Min xij/xij (2)

Transaction Amount Criteria (Benefit):	Size Criteria (Cost):
Bloom Box = 1/5 = 0,2	Bloom Box = 1/1 = 1
Bunga Meja = 2/5 = 0,4	Bunga Meja = 1/1 = 1
Hand Bouquet = 2/5 = 0,4	Hand Bouquet = 1/1 = 1
Karangan Bunga Congratulations = 4/5 = 0,8	Karangan Bunga Congratulations = 1/4 = 0,25
Karangan Bunga Dukacita = 5/5 = 1	Karangan Bunga Dukacita = 1/4 = 0,25
Karangan Bunga Wedding = 4/5 = 0,8	Karangan Bunga Wedding = 1/4 = 0,25
Standing Flower = 2/5 = 0,4	Standing Flower = 1/1 = 1
Price Criteria:	Sessional Criteria (Benefit):
Bloom Box = 1/2 = 0,5	Bloom Box = 3/5 =0,6
Bunga Meja = 1/2 = 0,5	Bunga Meja = 5/5 =1
Hand Bouquet = 1/5 = 0,2	Hand Bouquet = 5/5 = 1
Karangan Bunga Congratulations = 1/5 = 0,2	Karangan Bunga Congratulations = 3/5 = 0,6
Karangan Bunga Dukacita = 1/5 = 0,2	Karangan Bunga Dukacita = 5/5 = 1
Karangan Bunga Wedding = 1/5 = 0,2	Karangan Bunga Wedding =5/5 = 1
Standing Flower = 1/1 = 1	Standing Flower = 5/5 = 1

The following are the normalization results in Table 7 as follows:

Table 2. Normalization Results

Alternative	Normalization Results			
	Transaction Amount	Price	Size	Sessional
Bloom Box	0,2	0,5	1	0,6
Bunga Meja	0,4	0,5	1	1
Hand Bouquet	0,4	0,2	1	1
Karangan Bunga Congratulations	0,8	0,2	0,25	0,6
Karangan Bunga Dukacita	1	0,2	0,25	1
Karangan Bunga Wedding	0,8	0,2	0,25	1
Standing Flower	0,4	1	1	1

2. Per-Rangkingan (Preferences)

   Finally, this stage is the main stage where multiplying all the normalized attributes in Table 6 by the weight of each Criteria in the Average column of Table 5 with the formula:

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$$Vi = \sum wj\ rij \quad (5)$$

Here's the formula in the example:

(0.6441*Transaction Amount) + (0.119797*Price) + (0.0543980*Size) + (0.181725*Sessional) = End result.

The following is the calculation of preferences in Table 8 :

Table 3. Calculation of Preferences

Alternative	Calculation of Preferences
Bloom Box	(0,6441*0,2) + (0,119797*0,5) + (0,0543980*1) + (0,181725 *0,6) = 0,352147
Bunga Meja	(0,6441*0,4) + (0,119797*0,5) + (0,0543980*1) + (0,181725*1) = 0,553653
Hand Bouquet	(0,6441*0,4) + (0,119797*0,2) + (0,0543980*1) + (0,181725*1) = 0,517714
Karangan Bunga Congratulations	(0,6441*0,8) + (0,119797*0,2) + (0,0543980 *0,25) + (0,181725 *0,6) = 0,661858
Karangan Bunga Dukacita	(0,6441*1) + (0,119797*0,2) + (0,0543980 *0,25) + (0,181725 *1) = 0,863364
Karangan Bunga Wedding	(0,6441*0,8) + (0,119797*0,2) + (0,0543980 *0,25) + (0,181725 *1) = 0,734548
Standing Flower	(0,6441*0,4) + (0,119797*1) + (0,0543980 *1) + (0,181725 *1) = 0,613552

After the preference calculation process is carried out, a ranking can be produced based on the highest value of the preference, as seen in the following Table 9:

Table 4. Ranking Results

Alternative	Preferences
Karangan Bunga Dukacita	0.863364
Karangan Bunga Wedding	0.734548
Karangan Bunga Congratulations	0.661858
Standing Flower	0.613552
Bunga Meja	0.553653
Hand Bouquet	0.517714
Bloom Box	0.352147

So, the highest preference value is the Grief Bouquet worth 0.863364 which is the highest value of each category of flower sales on CV Usaha Sahabat.

Discussion

1. Criteria Page

This Criteria page view is a page to see a list of what criteria are used in decision analysis where on this page users can create, update, and delete criteria. Here is Figure 7 of the criteria page view:

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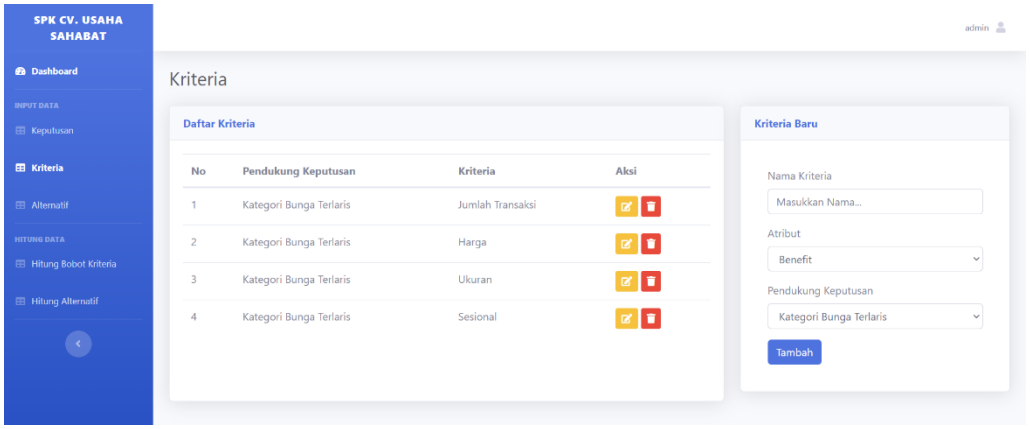
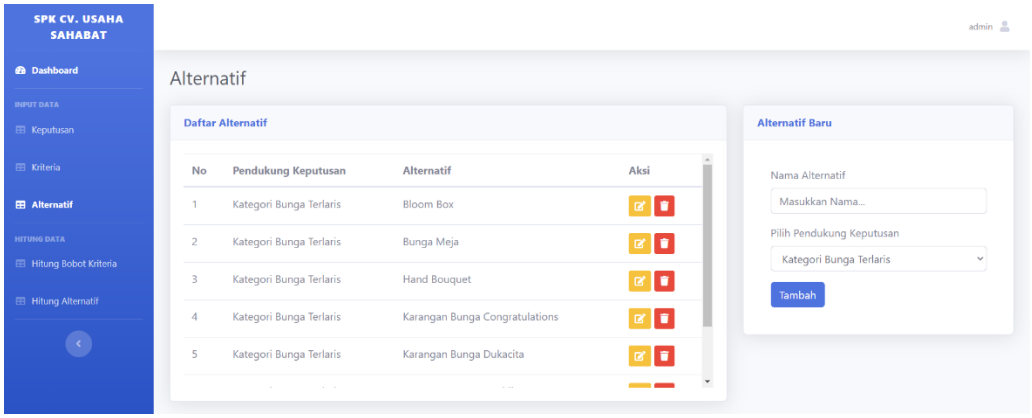
Figure 7. Criteria Page



2. Alternative Pages

The alternative page view is a page to see a list of alternatives that exist in making decisions where users can create, update, and delete alternatives in the alternative list. Here is Figure 8 of the alternative page view:

Figure 8. Alternative Pages



3. Criteria Weighting (AHP) Results Page

The Criteria weighting calculation page view is a page to process weighting on criteria so that on this page the user can see a list of the results of the weighting calculation and the user can input the value of the intensity of the importance. Here is Figure 9 of the page view of the weight calculation criteria:

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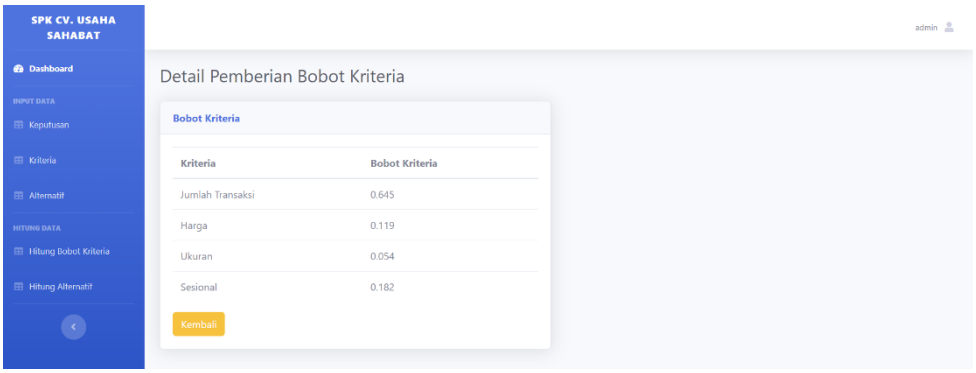
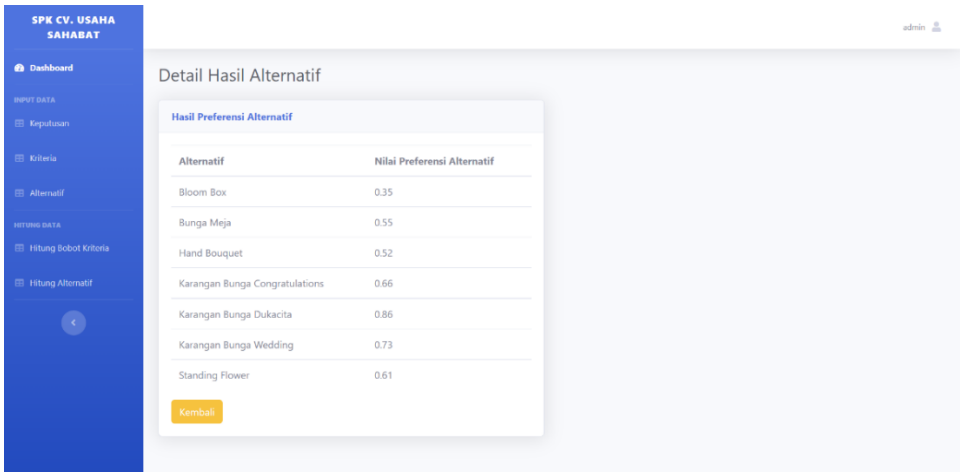
Figure 9. Criteria Weighting (AHP) Results Page



4. Preferences End Page (SAW)

The display of the final result page that has been obtained from the calculation of the spk application using the AHP and SAW algorithms in the value preference in the best-selling interest category on CV Usaha Sahabat can be seen as shown in Figure 10 below:

Figure 10. Preferences End Page (SAW)



CONCLUSION

The conclusions of the research based on the results of the analysis are:

1. The researcher can implement the AHP and SAW algorithms on the website-based Decision Support System application which successfully generates a preference value to determine the best-selling interest category on CV Usaha Sahabat and can run according to manual calculations that can support a decision.
2. The result of the highest preference value is the alternative of the Sorrow Bouquet obtaining a preference value of 0.86, this value is the highest value of each alternative.
3. The result of the comparison of the sales season between January (Congratulations) and February (Wedding) is the best-selling month in February because of the value of a preference value of 0.73 found in the Wedding Bouquet alternative, while January has a preference value of 0.66 in the Congratulations Bouquet alternative.
4. The Wedding Sales Season is the best-selling sessional.

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