

Decision Support System in E-Commerce in Purchasing SAW with Method Woven Fabric

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Abstract:

Purpose:

Choosing ikat woven fabric has several predetermined criteria. These criteria include price, quality, product type, and color. The decision support system for selecting ikat fabric purchases for buyers in e-commerce using the SAW (simple additive weighting) method is a system that can determine the results of the decision to select one of the ikat fabrics based on predetermined criteria and alternatives.

Methodology:

The SAW method is one of the decision-making methods often used in DSS. The research method refers to a literature study that aims to find references that suit the problem, then observation by collecting data at the specified research location and interviewing the owner and one of the MSME employees to obtain detailed information.

Findings:

This research determines the purchase of good woven fabric via e-commerce for ikat woven fabric products in Bandar Kidul village, Mojoroto subdistrict, Kediri city. Calculating the best-woven fabric for ikat products can use the simple additive weight (SAW) method so that one best-selling ikat fabric, namely silk woven fabric, is selected and meets the requirements, with a score of 0.76675.

Implication:

Based on this research, we can determine which suitable woven fabrics to buy using e-commerce for ikat woven fabric products in Bandar Kidul village, Mojoroto subdistrict, Kediri city. The simple additive weight (SAW) method can calculate the best-woven fabric for ikat products.

INTRODUCTION

Thanks to the Internet, technological advances have opened up new business opportunities. The growth of e-commerce is one of the advanced technologies driving digital business progress in Indonesia today. Currently, most people, in general, are familiar with e-commerce as an activity or place to sell products and buy physical or electronic products online. E-commerce is a process of buying and selling transactions that, in practice, are carried out online through electronic media, which, according to (2019), is a business-to-business transaction that occurs through the Internet network.

An evaluation and ranking of alternatives is produced in a decision support system using the Simple Additive Weighting (SAW) method, thus providing better insight and supporting more appropriate decision-making in selecting the most product sales. The results of this research are helpful for various parties from organizations and industries, as well as buyers and researchers interested in improving effective decision-making processes.

Decision Support System (DSS). is designed to assist decision-making in an organization or specific environment. SPK uses computer technology and special software to provide information, analysis, and user recommendations in decision-making. Following are some essential characteristics of Decision Support Systems: Automation and Computing: SPK uses computer technology to collect, store, and analyze data. It allows users to access relevant information quickly. Data and Information: DSS uses relevant data and information to assist users in making decisions. This data can come from various sources, such as internal databases, external sources, or historical data.

Analysis Models: SPK can use various data analysis techniques and mathematical modeling to produce better information about available options. It includes statistical analysis, regression analysis, simulation, and others. Interactivity: DSSs are often interactive, meaning users can interact with the system to access information and perform analysis. Users can ask questions, set parameters, or dig deeper into the data. Recommendations: One of the critical features of SPK is its ability to provide recommendations to users. This recommendation is based on data analysis and models built into the system.

Decision Support: SPK's main objective is to support decision-making. It may mean helping users choose the best solution from several available options or assisting them in planning their next steps. Flexibility: DSS can often be tailored to an organization's needs or problems. It means the system can be redesigned or configured to address changes in the business environment or decision-making needs. DSS is used in various fields, including business, operations management, human resource planning, and finance. With the help of DSS, organizations can make more informed and informed decisions, which can help increase their efficiency and productivity.

E-commerce. Short for electronic commerce refers to buying, selling, and exchanging products or services via the Internet or other digital platforms. In the context of purchasing woven fabrics, e-commerce refers to purchasing woven fabrics or woven fabric-related products online via websites, mobile applications, or e-commerce platforms. Purchasing woven fabric via e-commerce provides various benefits, including Wide Access: Buyers can access various types of woven fabric from various manufacturers or sellers without physically visiting the shop or production location. Ease of Shopping: Shoppers can search, select, and purchase woven fabrics easily from the comfort of their home or office. They can also do price and product comparisons quickly. Wide Choice: E-commerce often offers a wide choice of woven fabrics, ranging from different colors, designs, and sizes. Secure Transactions: E-commerce generally provides safe and secure payment methods. In addition, buyer information is also protected with encryption. Shipping and Returns: E-commerce sellers usually provide product delivery services to buyers' addresses. Additionally, there is the option to return the product if it does not meet expectations. In woven fabrics, e-commerce can also help promote and support local crafts and provide opportunities for woven fabric makers to sell their products more widely in national and international markets.

Method Simple Additive Weighting (SAW). It is a multi-criteria decision-making technique used in various fields, such as management, business, and engineering. This method selects the best alternative from several existing alternatives based on several predetermined criteria. The SAW approach assumes that each criterion has a different weight or level of importance in decision-making. This weight reflects the level of priority or preference for each criterion used. The main steps in the SAW method are as follows:

- a. Determining Criteria: Identify the relevant criteria to the problem at hand. These criteria must be able to be measured or assessed quantitatively.
- b. Data Normalization: Criteria with different units or ranges of values must be normalized to be compared. Normalization is done by changing the criteria values to the same scale, such as 0 to 1.
- c. Determining Weights: Determine the weights for each criterion. This weight reflects the level of importance of each criterion in decision-making. Weights are usually determined based on subjective judgment or through specific mathematical analyses, such as pairwise comparisons.
- d. Calculating Weighted Score: Calculate the weighted score for each alternative by multiplying the criterion value by the weight of each criterion, then adding up the results. This weighted score reflects how each alternative meets the specified criteria.

The SAW method is a relatively simple and easy-to-understand method, but it also has several disadvantages. One is its sensitivity to changes in criterion weights. If the criteria weights are changed, the ranking results can change significantly. In addition, this method needs to consider interactions between criteria, which can be a weakness in cases where criteria influence each other. Therefore, the selection of appropriate weights and careful consideration of the criteria are essential in the application of the method.

METHODS

Research Stages. The method in this research refers to literature studies aimed at finding references that are appropriate to the problem, then observation by collecting data at the designated research location and interviews with the owner and one employee of the UMKM, which aims to obtain detailed information. Implementation of a decision support system that aims to find out the most sales data using a simple additive weighting method, which refers to sales in E-commerce from January 2023 to December 2023.

Metode Simple Additive Weighting (SAW). The SAW method is one of the decision-making methods often used in DSS. This method allows assigning weight to each relevant criterion in the decision-making process. These criteria can include price, quality, motif, and size. In the SAW method, each criterion is given a certain weight according to its level of importance. The existing data will be normalized, and finally, the alternative ranking will be calculated based on comparing each alternative's weights and criteria values.

Determining Weights: Determine the weights for each criterion. This weight reflects the level of importance of each woven fabric criterion in decision-making. Weight is usually determined based on subjective judgment or through specific mathematical analysis, which will affect the manual calculations that are carried out. If the weight value is determined incorrectly, it will affect the results of the manual calculation.

Determining Criteria: Identify the criteria that are relevant in research specific to the fabric that has become the object of this research. The criteria for this woven fabric can be measured and assessed from the use of the primary material, the first being the use of silk thread. Silk thread can provide or produce good and comfortable fabric if used in the context of these criteria for choosing which fabric is good and which has the best braces or the best that this woven fabric MSME has in making decisions to get the best fabric using the SAW method.

RESULTS AND DISCUSSION

In managing research results, the author determines the steps for completing manual work using the simple additive weighting (SAW) method, namely by adding up the weights for each alternative value using Microsoft Excel calculations, which are used to determine the highest purchase of fabric from one e-commerce.

Workmanship Manual. Criteria and Weights explain the criteria used for assessment using the SAW method with the limitations used in these criteria. First, you need to know that the alternative will be based on the material type and price criteria Presented in Table 1.

Table 1. Alternatives

No.	Code	Alternative
1.	A1	Woven Sarong
2.	A2	Silk Woven Fabric
3.	A3	Rayon Woven Fabric
4.	A4	Pseudo-Silk Woven Fabric
5.	A5	Shall Tenun

Next, determine the criteria and weights. Below, we present it in the form of Table 2;

Table 2. Criteria and Weights

Code	Criteria	Range	Weight
C1	Price	25%	0.25
C2	Quality	35%	0.35
C3	Types Of Products	25%	0.25
C4	Color	15%	0.15
C5	Qty	-	-

Then, with the criteria above, there are several sub-criteria for each criterion along with their weight values, which are used to determine the value obtained based on data obtained in a complex manner, presented in Table 3.

Table 3. Sub Criteria

Criteria	Variable	Mark
	Cheap	1
C1	Currently	2
	Expensive	3
	District	1
C2	See You Tomorrow	2
	Sutra	3

	Woven Sarong	1
C3	Woven Fabric	2
	Shall Tenun	3
	Bright	1
C4	Neutral	2

The next step is to determine the Alternative Value for each product based on the Criteria Values determined in the previous table. We present it in the form of Table 4 below:

Table 4. Alternative Values

No.	Alternative	Criteria			
		C1	C2	C3	C4
1.	Woven Sarong	2	3	1	2
2.	Silk Woven Fabric	3	3	2	3
3.	Rayon Woven Fabric	1	1	2	2
4.	Semi-Silk Woven Fabric	2	2	2	3

After the alternative values are determined, the next step is calculating the normalization matrix. If columns C1, C2, C3, and C4 have a maximum value of 3, then each row is divided by the maximum value in that column. The normalization results above are presented in the following matrix normalization table.

Table 5. Matrix Normalization

Alternative	C1	C2	C3	C4
A1	0,667	1	0,333	0,667
A2	1	1	0,667	1
A3	0,333	0,333	0,667	0,667
A4	0,667	0,667	0,667	1
A5	0,667	1	1	0,667

The next step is to calculate the value of each alternative by multiplying each value in the criteria column by a predetermined weight and then adding up the results for ranking use, with the known weights $W \{0.25, 0.35, 0.25, 0.15\}$.

Table 6. Ranking Results

Alternative	Ranking Results
A1	0,70005
A2	0,91675
A3	0,4666
A4	0,71695
A5	0,8668

Table 7. Sequencing Results

Alternative	Ranking Results	Ranking
A2	0,91675	1
A5	0,8668	2
A4	0,71695	3

A1	0,70005	4
A3	0,4666	5

Based on Table 7 above, it can be concluded that the best-selling woven fabric that has met the requirements that have been determined with the highest score is Silk Woven Fabric, which received a ranking of 1 with a score of 0.76675 and the lowest score was for the Rayon Woven Fabric product, namely with a score of 0, 43335.

CONCLUSION

Based on research conducted by the author to determine the purchase of good woven fabric in e-commerce for ikat woven fabric products in Bandar Kidul village, Mojooroto subdistrict, Kediri city. Calculating the best-woven fabric for woven ikat products can use the simple additive weight (SAW) method. One best-selling woven ikat fabric, namely silk woven fabric, with a score of 0.76675, was selected and met the requirements.

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