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APPLICATION OF SIMPLE ADDITIVE WEIGHTING METHOD IN SELECTING ACCESSORY SUPPLIERS AT AL-FAZZA COSMETIC STORE

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Abstract Al-Fazza Cosmetic Store is a store engaged in the sale of cosmetics. In an effort to develop and increase sales value, Al-Fazza Store began selling various accessories such as bracelets, necklaces, hair clips and headscarves. To get quality goods and maximum profit, supplier selection is important. However, supplier selection is a problem because each supplier has its own advantages and disadvantages and uniqueness. To help select suppliers at the Al-Fazza Cosmetic Store, the decision support system can provide decision recommendations quickly and accurately based on the criteria given by the decision maker. The method that will be used in processing data and determining decisions in this decision support system is simple additive weighting (saw). The decision results provided by this method can be used as recommendations by decision makers in determining the best supplier.

Keywords: simple additive weighting; information systems; decision support systems; suppliers

Abstrak: Toko Kosmetik Al-Fazza merupakan toko yang bergerak di bidang penjualan kosmetik. Dalam upaya untuk mengembangkan dan meningkatkan nilai penjualan, Toko Al-Fazza mulai menjual berbagai aksesoris seperti gelang, kalung, jepit rambut, dan jilbab. Untuk mendapatkan barang yang berkualitas dan keuntungan yang maksimal, pemilihan supplier merupakan hal yang penting. Akan tetapi, pemilihan supplier menjadi suatu permasalahan karena setiap supplier memiliki kelebihan dan kekurangan serta keunikannya masing-masing untuk membantu pemilihan supplier pada Toko Kosmetik Al-Fazza. Sistem pendukung keputusan tersebut dapat memberikan rekomendasi keputusan secara cepat dan tepat berdasarkan kriteria yang diberikan oleh pengambil keputusan. Metode yang akan digunakan dalam pengolahan data dan penentuan keputusan pada sistem pendukung keputusan ini adalah simple additive weighting (saw). Hasil keputusan yang diberikan oleh metode ini dapat digunakan sebagai rekomendasi oleh pembuat keputusan dalam menentukan supplier terbaik.

Kata kunci: simple additive weighting; sistem informasi; sistem penunjang keputusan;pemasok

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INTRODUCTION

Al-Fazza cosmetic shop is a shop that is engaged in the sale of cosmetics. In an effort to develop and increase sales value, Al-Fazza Shop began selling various accessories such as bracelets, necklaces, hair clips and accessories. hijab. In order to get goods with good quality and maximum profit, selecting a supplier is an important aspect. [1] . Suppliers have a role in maintaining the continuity of buying and selling activities in the store because suppliers affect stock availability, product quality, selling prices and of course store sales profits. Because of the importance of the role of suppliers, the supplier selection process is one of the important and critical activities in the store. [2]

Election supplier Alone is a complex problem that often occurs happen along the amount suppliers who offer the goods in the shop . Every supplier own lack And excess each as well as different characters . Difficult For determine the best supplier from all supplier [3] . For help finish problem election supplier at Al -Fazza cosmetic store then made system support decision election supplier .

System support decision is A useful system For management For support settlement problem taking complex decisions . System This can help semi- structured problem solving And No structured [4], [5] . System This is system which is developed And adapted in finish problem in take decision . System information This is system interactive computerized And flexible [6] . System support decision capable provide ability For manipulate data, present information , as well as give ability modeling in the process of helping taking decision . Result the decision provided by system This can used as recommendation by maker decision in determine his decision [7] . For produce system support decisions that can be made help give recommendation choice the right decision needed methods that can processing And produce choice recommendation decision . In help problem election Supplier at Al- Fazza Store the method that will be used namely Simple Additive Weighting (SAW) [1], [8] .

One of method in finish the problem of multiple attribute decision making is Simple Additive Weighting (SAW) method . Draft method This with do search results summation weighted from each performance rating alternative in all attributes . Excess from method This that is Can give evaluation with more appropriate . Method This Can produce ranking that can used in determine choice supplier best from all choice existing suppliers [9], [10] .

The application of the SAW method has been carried out by several studies such as [11] applying this saw method aims to help admins in determining paper plano, so that admins do not have to manually count one by one paper which results in slow customer handling and will have a negative impact on service. With this system, it can help admins in providing

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information and insight about paper plano that will be selected based on the cheapest price estimate. Research [12] a decision support system that can help the academic department decide which students they will choose as teaching assistants and help the head of the informatics engineering study program to get information about students who have been teaching assistants. Research [13] applies the same method for a decision support system that aims to facilitate the Housing and Settlement Service in determining prospective recipients of the home renovation program with the right target. With the same method, many problems can help leaders in making decisions and can be used in various fields, both in business, health, education and others.

From the problems that have been outlined so objective study This done For produce design system support decisions that can be made used in help give recommendation supplier accessories best in Al- Fazza Store so that choice supplier can produced with fast And with more consideration accurate . The method to be used used in look for And produce decision choice supplier in system This namely Simple Additive Weighting (SAW). The criteria used as reference evaluation in choose supplier on system support decision This is quality goods , price , cost send , warranty [14].

METHOD

To collect information and data needed in designing a decision support system that will be used in Al-Fazza Store, the things that are done are conducting observations of the decision-making process for selecting suppliers in Al-Fazza Cosmetic Store. Collecting and studying files and data related to supplier selection and collecting alternative suppliers that will be chosen in Al-Fazza Store. Furthermore, conducting interviews with decision makers and parties involved in decision making to find out the criteria used in Al-Fazza Store for determine supplier. Finally, conduct a literature study to support the research carried out by studying and collecting journals and books that have related to the supplier selection case being studied [15], [16] .

This method will later support the selection suppliers at Al-Fazza Store by providing data manipulation capabilities, modeling and providing interactive information. [17] .

To find the best decision option from the options suppliers in the case of selecting accessory suppliers at the Al-Fazza Store, data processing and calculations are carried out using the Simple Additive Weighting (SAW) method. The following are the stages carried out to find the best supplier options using the SAW method [18], [16] .

1) Determine the criteria used in decision making, assign weight values to the criteria and categories of benefit or cost criteria.
2) Determine standard mark along with its weight and provide an

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assessment of each existing alternative based on decision-making criteria.

3) Perform matrix normalization.

$$R_{ij} = \frac{x_{ij}}{max_{i(x_{ij})}} \text{ (Benefit) (1)}$$

$$R_{ij} = \frac{min_i(x_{ij})}{x_{ij}} \text{ (Cost) (2)}$$

Information :
Benefit = if the greater the value of the alternative, the better it is
Cost = if the smaller the value of the alternative, the better it is
Rij : normalized performance rating value
Xi: the attribute value of each criteria
Max xij: largest value of each criteria i
Min xij: smallest value of each criteria i

4) Perform a search for the Vector Vi Value.

$$V_i = \sum_{j=1}^{n} W_j R_{ij} \quad (3)$$

Information :
Vi : ranking for each alternative
wj : weight value of each criterion
rij : normalized performance rating value
The largest Vi value indicates that alternative Ai is the best choice, followed by the second and subsequent Vi values.

5) Perform ranking of Vector value results.

RESULTS AND DISCUSSION

After the process of collecting information and data carried out through field observations by seeing directly how decisions are made at Al-Fazza Store and studying the documents used in decision making, then interviewing related parties involved in making supplier selection decisions at Al-Fazza Store, and reviewing the problems being studied through relevant journals and books. Furthermore, the information and data obtained are processed to produce supplier decisions by utilizing a deci sion support system. Data processing in this decision support system will use the Simple Additive Weighting (SAW) method. The steps for finding the best supplier using the Simple Additive Weighting (SAW) method can be seen below.

1) Determining the criteria to be reference in determining supplier selection at Al- Fazza Store , then provide a weight value for the criteria and categories of criteria the .

Table 1. Criteria , Weights , and Type

Criteria		Weight	Type
Quality	C1	5	Benefits
Price	C2	4	Benefits
Cost Send	C3	4	Benefits
Warranty	C4	3	Benefits

2) Determine standard evaluation as well as its weight and provide an assessment of each alternative supplier that will be selected based on decision-making criteria.

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Table 2. Scale Evaluation

Information	Weight
Very Good	5
Good	4
Enough	3
Bad	2
Very Bad	1

Table 3. Alternatives Supplier And The Value

Alternative	C1	C2	C3	C4
Supplier A	5	4	3	3
Supplier B	4	5	3	4
Supplier C	5	5	3	3
Supplier D	5	4	4	5
Supplier E	4	5	4	5
Supplier F	4	5	3	5

3) Perform matrix normalization.

Table 4. Alternatives Supplier And Matrix Normalization Value

Alternative	C1	C2	C3	C4
Supplier A	1	0,8	0,75	0,6
Supplier B	0,8	1	0,75	0,8
Supplier C	1	1	0,75	0,6
Supplier D	1	0,8	1	1
Supplier E	0,8	1	1	1
Supplier F	0,8	1	0,75	1

4) Perform a search for the Vector Vi Value.

$$V1 = (1x5) + (0{,}8x4) + (0{,}75x4) + (0{,}6x3) = 13$$

$$V2 = (0{,}8x5) + (1x4) + (0{,}75x4) + (0{,}8x3) = 13{,}4$$

$$V3 = (1x5) + (1x4) + (0{,}75x4) + (0{,}6x3) = 13{,}8$$

$$V4 = (1x5) + (0{,}8x4) + (1x4) + (1x3) = 15{,}2$$

$$V5 = (0{,}8x5) + (1x4) + (1x4) + (1x3) = 15$$

$$V6 = (0{,}8x5) + (1x4) + (0{,}75x4) + (1x3) = 14$$

5) Perform ranking of the results of the vector V calculation based on the highest to the lowest value.
The highest value from the vector V calculation results will be the best recommendation from the existing supplier options.

Table 5. Alternatives Supplier And Vector Vi

Alternatif	Vi	Rank
A_1	13	6
A_2	13,4	5
A_3	13,8	4
A_4	15,2	1
A_5	15	2
A_6	14	3

CONCLUSION

The simple additive weighting (SAW) method is used to process data and produce recommendation decision In this decision support system, calculations can be made and recommendations for supplier rankings can be produced which can be used for provide recommendations for the best

supplier options. The decision results from this decision support system are not final decision but rather a decision recommendation that can be used by decision makers in considering their options.

With this decision support system, it is hoped that the selection of suppliers at Al-Fazza stores will become easier and faster according to the desired criteria. The more specific the criteria and weighting, the more accurate the results obtained from the existing alternative selection process.

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