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Determination of Chicken Meat Suppliers Using the CPI Method

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ABSTRACT

In this study the authors conducted research at the Brastagi Medan supermarket in determining chicken meat suppliers. In determining the best supplier of chicken meat, they still do not use a special system so that the determination of suppliers is often inaccurate. To overcome the above, a decision support system application is applied in determining chicken meat suppliers so that suppliers will get rewards in the form of prizes and motivation in entering goods at supermarkets. Another problem that occurs is the recording of valuation data and the calculation of values based on the dimensions set at the Brastagi Medan supermarket and there is no use of a decision support system method in making decisions in selecting the best chicken meat supplier. The programming language used to create the application vizPHP and MySQL and the methods used areCPI (Composite Performance Index) method. Processing system Selection of the best chicken meat supplier at the Medan Brastagi supermarket. The purpose of this research is to design a system for selecting the best chicken meat supplier and entering the most goods at the supermarket

INTRODUCTION

Decision support system is one of the software products developed specifically to assist the decision-making process. As the name implies, the purpose of this system is as a "second opinion" or "information sources" which can be used as material for consideration before deciding on a particular policy and can overcome the weaknesses and shortcomings of the implementation of the process of determining the value of promotion. A decision support system is the selection of several alternative choices that can be selected, where the process requires a certain mechanism to produce an optimal decision.[1]

Composite Performance Index (CPI) is a composite index that can be used to determine ratings or ratings of various alternatives (i) based on several criteria (j). The Composite Performance Index (CPI) method is a method of calculating performance index-based decision making, the CPI method is used for assessments with non-uniform criteria.[2]

METHODS

The following is a scheme for conducting research:

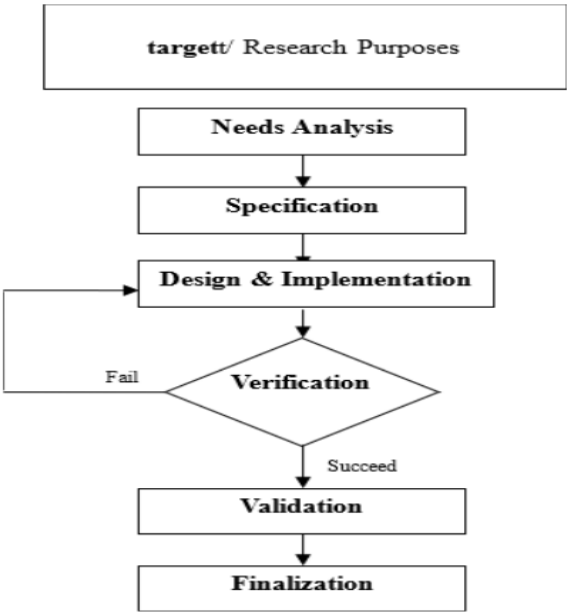

Figure 1. Design Procedure

RESULTS AND DISCUSSION

Application of the CPI (Composite Performance Index) Algorithm in the Selection of the Best Chicken Meat Supplier at the Brastagi Supermarket Medan. The problems found in conducting this research are:

1. An application has not yet been developed that can help the Brastagi Medan Supermarket in choosing the Best Chicken Meat Supplier.
2. The CPI (Composite Performance Index) method has not yet been developed in the implementation of a decision support system for selecting the Best Chicken Meat Supplier.

Cpi Manual Calculation

a. Table of Criteria and Subcriteria

Table 1 Criteria and criteria weight

Criteria ID	Criteria Name	Criteria Weight
C1	Price	0.30
C2	Meat Quality	0.25
C3	Delivery	0.20
C4	Response	0.15
C5	Weight Accuracy	0.10

Table 2 Sub-criteria and sub-criteria weights

Subcriteria ID	Subcriteria Name	Information	Subcriteria Weight
C1	Cheap	Price Per Kg < 32,500	3
	Standard	32,500 >= Price Per Kg <= 35,000	2
	Expensive	Price > 35,000	1

	Good	White flesh color without bruises, clean from fine hairs	3
C2	Enough	White Flesh Color With Slight Bruises, Still There Is Fine Hair	2
	Not enough	Reddish Flesh Color Due to Lots of Bruises and Lots of Fine Hair	1
C3	Fast	1 – 3 Days	2
	Slow	Above 3 Days	1
C4	Fast	Phone, Whatsapp and Email Reply On The Same Day	2
	Slow	Tel, Whatsapp and Email Reply The Next Day	1
C5	Appropriate	Total Weight According to Order	2
	Less precise	The total weight is not according to the order with a difference in scales reaching 1 kg	1

b. Table of Prospective Suppliers

Table 3 Table of Prospective Suppliers

Supplier Name	Criteria	Subcriteria	Subcriteria Weight
PT. Ciomas Adisatwa	Price	Expensive	1
	Meat Quality	Not enough	1
	Delivery	Fast	2
	Service Response	Fast	2
	Weight Accuracy	Appropriate	2
PT. Nasuba	Price	Standard	2
	Meat Quality	Enough	2
	Delivery	Fast	2
	Service Response	Fast	2
	Weight Accuracy	Less precise	1
PT. Amerta Indah Otsuka	Price	Expensive	1
	Meat Quality	Not enough	1
	Delivery	Fast	2
	Service Response	Fast	2
	Weight Accuracy	Appropriate	2
CV. Prosperous Food Works	Price	Cheap	3
	Meat Quality	Good	3
	Delivery	Fast	2
	Service Response	Fast	2
	Weight Accuracy	Appropriate	2

c. Table of Alternative Weight Values

Table 4 Table of Alternative Weight Values

Supplier	Criteria				
	C1	C2	C3	C4	C5
P1	1	1	2	2	2
P2	2	2	2	2	1
P3	1	1	2	2	2
P4	3	3	2	2	2

d. Search Minimum Value of Each Criterion

Table 5 Table of Minimum Value for Each Criterion

Supplier	Criteria				
	C1	C2	C3	C4	C5
P1	1	1	2	2	2
P2	2	2	2	2	1
P3	1	1	2	2	2
P4	3	3	2	2	2
min	1	1	2	2	1

e. Calculation of the CPI Matrix

P1 – C1 = Weight C1 / Min
= 1/1
= 1
P1 – C2 = C2 Weight / Min
= 1/1
= 1
P1 – C3 = C3 Weight / Min
= 2/2
= 1
P1 – C4 = C4 Weight / Min
= 2/2
= 1
P1 – C5 = C5 Weight / Min
= 2/1
= 2

For Suppliers P2 to P4, the same calculation is carried out as above and the calculation results for the CPI matrix are as follows:

Table 6 Supplier Criteria Value

Supplier	Criteria				
	C1	C2	C3	C4	C5
P1	1	1	1	1	2
P2	2	2	1	1	1

P3	1	1	1	1	2
P4	3	3	1	1	2

f. CPI Score Matrix Calculation

New Value = Old Value * 100

Table 7 Calculation of the CPI Score Matrix

Supplier	Criteria				
	C1	C2	C3	C4	C5
P1	100	100	100	100	200
P2	200	200	100	100	100
P3	100	100	100	100	200
P4	300	300	100	100	200

g. CPI Transformation Matrix Calculation

New Value = Old Value * Criteria Weight

Table 8 Calculation of the CPI Transformation Matrix

Supplier	Criteria				
	C1	C2	C3	C4	C5
P1	100*0.30	100*0.25	100*0.20	100*0.15	200*0.10
P2	200*0.30	200*0.25	100*0.20	100*0.15	100 * 0.10
P3	100*0.30	100*0.25	100*0.20	100*0.15	200*0.10
P4	300*0.30	300*0.25	100*0.20	100*0.15	200*0.10

Then the results are obtained:

Table 9 CPI Transformation Matrix Results

Supplier	Criteria					
	C1	C2	C3	C4	C5	Total
P1	30	25	20	15	20	110
P2	60	50	20	15	20	155
P3	30	25	20	15	20	110
P4	90	75	20	15	20	220

h. Ranking

Table 10 Supplier Ranking

Supplier	Final Score	Rank
CV. Prosperous Food Works	220	1
PT. Nasuba	155	2
PT. Ciomas Adisatwa	110	3
PT. Amerta Indah Otsuka	110	3

So the selected distributor is CV. Prosperous Food Works with the highest score of 220.

Broadly speaking, the business process system to be designed is described by a use case *Diagram* contained in Figure 2:

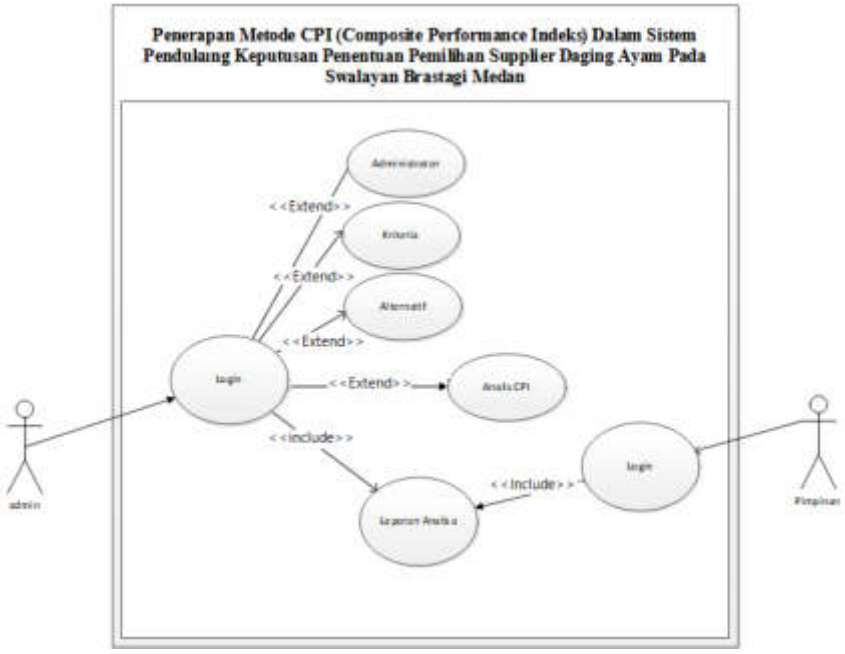

Figure 2. Use Case Diagram

The design of the classes to be used in the system to be designed can be seen in Figure 3:

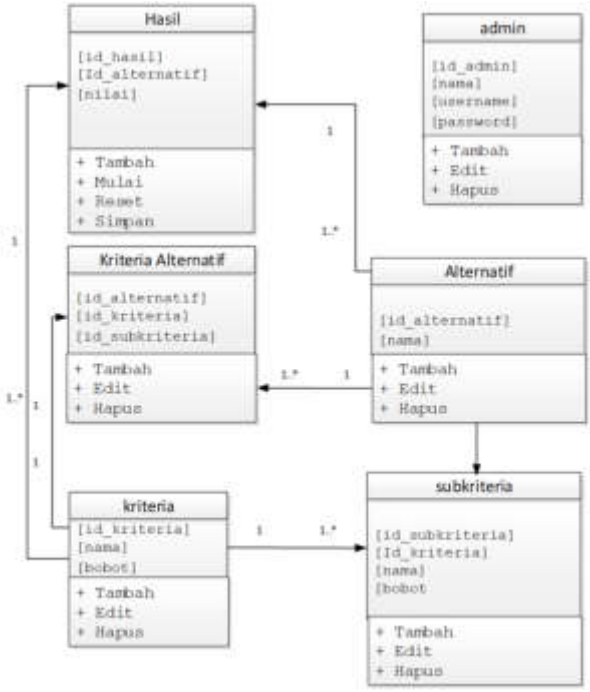

Figure 3. Class Diagrams

Results display

1. Display the criteria data form

The appearance of the form performed by the admin in processing the criteria data can be explained by the state steps shown in Figure 4 below:

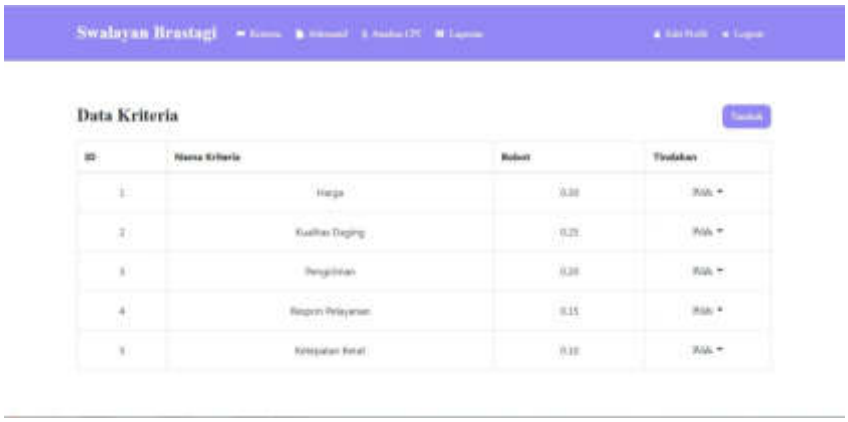

Figure 4. Display of the criteria data form

2. Alternative data form display

The appearance of the form performed by the admin in processing alternative data can be explained by the state steps shown in Figure 5 below:

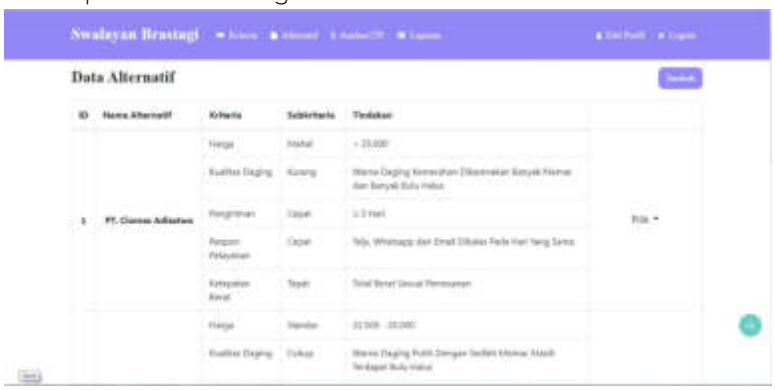

Figure 5. Display of alternative data forms

3. View the decision analysis data form

The form display performed by the admin in decision analysis data processing can be explained by the state steps shown in Figure 6 below:

Figure 6. Display of the decision analysis data form

4. Display the analysis report form

The display of the form performed by the admin in processing the analysis report data can be explained by the state steps shown in Figure 7 below:

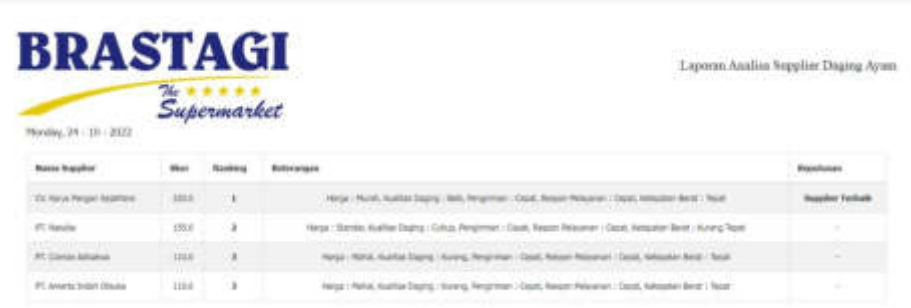

Figure 7. Display of the analysis report form

CONCLUSION

The information system for presenting reports on the selection of the best chicken meat suppliers will make it easier for companies to see company activities. The programming languages used to create applications, namely PHP and MySQL, calculate and determine the selection of the best chicken meat supplier based on calculations using the CPI (Composite Performance Index) method.

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