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Decision Support System in Determining the Level of Customer Satisfaction in the SME Corner at the Department of Cooperatives, Small and Medium Enterprises, Deli Serdang Regency with the Analytical Hierarchy Process (AHP) Method

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ABSTRACT

In order to increase customer satisfaction at the SME Corner of Deli Serdang, a research was conducted on the level of customer satisfaction in the SME Corner of Deli Serdang. To find out the extent to which the SME Corner's ability to provide satisfaction through its products, services, finances, delivery and company conditions, information marketing research is needed from the results of the marketing research aimed at knowing the attitudes and behavior of customers towards what is most influential in making decisions to become SME Corner customers in Department of Cooperatives, Small and Medium Enterprises Deli Serdang Regency. This study starts from the stage of analyzing the current system obtained from direct interviews with related parties and observations. While the design method uses the Unified Modeling language (UML) to describe the system design. In this case, to calculate the level of customer satisfaction, the AHP (Analytical Hierarchy Process) method is used. By using a decision-making system, it can provide convenience for the Deli Serdang UKM Corner to determine customer satisfaction in improving the quality to determine the level of customer satisfaction which is applied using PHP programming and MySql database. The system was developed using a software engineering approach, including analysis, design and implementation. At the analysis stage, process analysis, input analysis, output analysis, weakness analysis of the current system and needs analysis are carried out.

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1. INTRODUCTION

UKM (Small and Medium Enterprises) as the name implies, UKM is a small business that is synonymous with small industry and home industry which only consists of a few workers. SMEs are known to be small businesses, but SMEs play an important role in the growth and development of the national economy. SMEs make a sizeable contribution to the national economy from income taxes [1] [2].

Currently, SMEs almost dominate the Indonesian business sector. Therefore, to develop SMEs, the government needs to protect SMEs so that they can compete fairly with other larger economic enterprises. And we also know that during the monetary crisis, large companies collapsed, SMEs were still able to survive the crisis, so SMEs need to get special attention from the government to be further developed.

There is one SME outlet in Deli Serdang that is well known to the public, namely the Deli Serdang SME Corner which was formed under the authority of the Department of Cooperatives, Small and Medium Enterprises of Deli Serdang Regency with the aim of helping the economy of SMEs. The UKM Corner is located at Jalan Karya Utama No. 4 Deli Serdang Regency. Its location in the Deli Serdang Regency Government Office Area makes the UKM Corner not a little visited by the public, the dominant being office workers.

The SME Corner sells various kinds of SME products taken from SME actors in Deli Serdang Regency. The products sold and this form of service will affect customer satisfaction which in turn has an impact on increasing the income of the SME Corner.

The general understanding of customer satisfaction or dissatisfaction is the result of differences between customer expectations and the performance perceived by the customer. The SME Corner is required to be able to understand what the desires or expectations of customers are from the quality of products and the quality of services provided in order to create satisfaction for their customers.

To find out the extent to which the SME Corner's ability to provide satisfaction through its products and services, marketing research is needed. The information from the marketing research results aims to determine the attitudes and behavior of customers towards what is most influential in making decisions to become SME Corner customers at the Cooperatives, Small and Medium Enterprises Service. Medium Deli Serdang Regency.

Herbert A. Simon, Nobel laureate said that managers or decision makers are no longer trying to optimize a single goal such as maximizing profits or minimizing costs, but have changed to trying to achieve a satisfactory level of profit on the achievement of several goals, for example: satisfactory profit levels, responsibility, social, protection of society, relations with labor unions, and protection of the environment [3] [4] [5].

The Analytical Hierarchy Process method was developed by Thomas L. Saaty, a mathematician [6]. This method is a framework for making effective decisions on complex problems by simplifying and accelerating the decision-making process by breaking the problem into its parts, arranging these parts or variables in a hierarchical arrangement, assigning numerical value to subjective judgments about the importance of each. variables and synthesize these considerations to determine which variable has the highest priority and act to influence the outcome of the situation [7] [8] [9]. This Analytical Hierarchy Process method helps solve complex problems by structuring a hierarchy of criteria, interested parties, results and by drawing on various considerations in order to develop weights and priorities [10] [11] [12]. This method also combines the power of feelings and logic involved in various problems, then synthesizes various considerations into results that match our intuitive estimates as presented in the considerations that have been made [13] [14] [15].

2. RESEARCH METHODS

2.1 Description of the Analytical Hierarchy Process (AHP)

AHP is a comprehensive decision-making model. AHP has the ability to solve multi-objective and multi-criteria problems based on the comparison of preferences of each element in the hierarchy. Basically, the procedure or steps in the AHP method include [16] :

a. Define the problem and determine the desired solution, then arrange a hierarchy of the problems encountered.
b. Determines the priority of elements,The first step in determining the priority of elements is to make a pair comparison, which is to compare elements in pairs according to the given criteria. The pairwise comparison matrix is filled in using numbers to represent the relative importance of an element to other elements.
c. synthesis,The considerations for pairwise comparisons were synthesized to obtain the overall priority. The things that are done in this step are:
   Add up the values of each column in the matrix, divide each value from the column by the corresponding column total to obtain a normalized matrix, and add up the values from each row and divide by the number of elements to get the average value.
d. Measuring Consistency,In decision making, it is important to know how good the consistency is because we don't want a judgmental decision with low consistency. The things that are done in this step are: Multiply each value in the first column by the relative priority of the first element, the value in the second column by the relative priority of the second element, and so on, add up each row, the result of the row sum divided by the corresponding relative priority element. , and add the quotient above with the number of elements, the result is called max.
e. Calculate Consistency Index (CI), with the formula:
   $$CI = (\lambda \max - n)/n \quad (1)$$
   where : n = number of elements.
f. Calculate Consistency Ratio (CR), with the formula:
   $$CR = CI/RC \quad (2)$$
   where:
   CR = Consistency Ratio
   CI = Consistency Index
   IR = Random Consistency Index
g. Check hierarchy consistency.
   If the value is more than 10%, then the data judgment assessment must be corrected. However, if the consistency ratio (CI/RI) is less or equal to 0.1, then the calculation results can be declared correct.

3. RESULTS AND DISCUSSION

3.1 System Implementation

System implementation is the stage in implementing the system that has been built, where later it will be known the quality of the system designed, whether it can run well and in accordance with the expected goals. In carrying out the implementation, several facilities related to hardware (hardware) and software (software) are prepared.

3.2 System Implementation Stages

In this system the user can enter their own data for each parameter according to the range provided by the system. The system will process the input data to be grouped according to the membership and rules that have been determined. The output of this system is to determine the level of customer satisfaction using the AHP method.

a. Login Form

The login form is the entrance for users to be able to access the menu facilities in the program system. By first entering the user id and password, the main menu will appear. Display login form can be seen in the following image.

Figure 1. User Login Form Display

b. Home Form Display

In the active home screen, namely entering and exiting, to be able to access other menus by using the login facility in the entry menu. This form is the main display of the program content, where with the home menu view the user can operate the program optimally and can also use the existing facilities in the program. The main menu form is as shown in the image below:

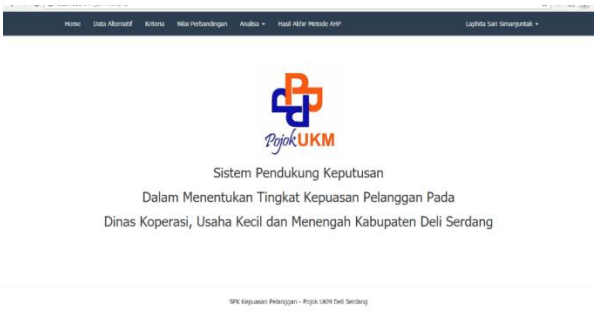

Figure 2. Home Form Display

c. Criteria Data Form

The criteria data input form serves to input criteria for customer satisfaction. This form has 4 buttons, namely: add data to add criteria, change data to change criteria, delete to delete criteria and delete ticks to remove ticks from selected data.

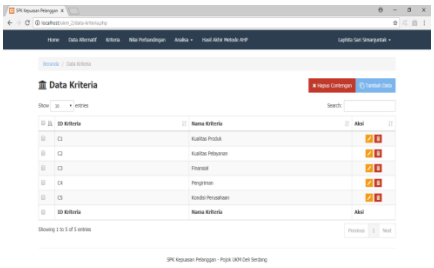

Figure 3. Criteria Data Form Display

d. Alternative Data Form Display

Just like the alternative data form, the alternative data input form serves to input alternatives for customer satisfaction. This form has 3 buttons, namely: add data to add an alternative, change data to change an alternative, delete to delete an alternative.

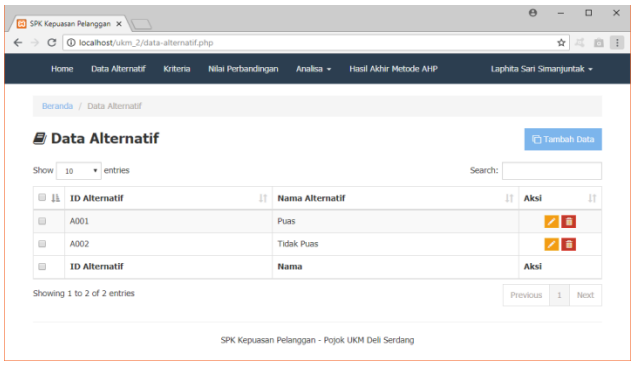

Figure 4. Alternative Data Form Display

e. Display of Criteria Paired Comparison Form

This view is used to enter comparison values between criteria from the criteria data that has been entered. From this also functions to process criteria data and also row and column values so that they get priority weights. In this form there are 2 buttons, namely the process button to process the selected value data and the next button to display alternative pairwise comparisons.

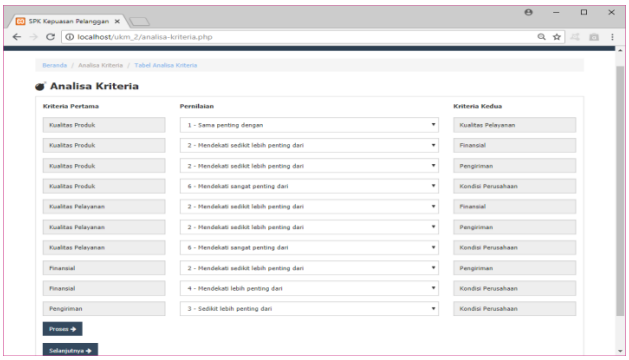

Figure 5. Display of Criteria Paired Comparison Form

f. Alternative Analysis Form Display

This view is used to enter the comparison values between alternatives from the alternative data that has been entered. This display is used to enter the comparison values between alternatives from the alternative data that has been entered. This form also functions to process alternative data as well as row and column values so that they get priority weights. In this form there is 1 button, namely the process button to process the selected value data.

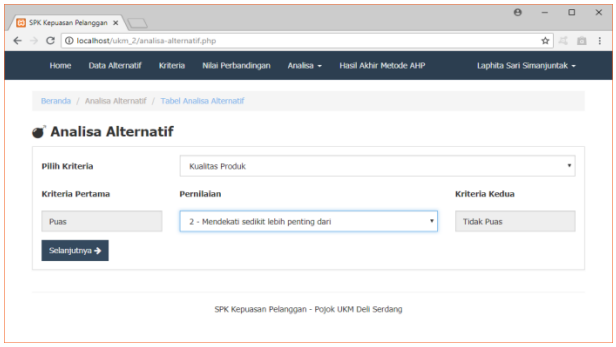

Figure 6. Alternative Analysis Form Display

g. Criteria Comparison Form Display

This form is a display for the calculation results of the comparison value for the criteria that have been entered from the criteria analysis so that the priority value is obtained. There is one button, namely the delete all data button which functions to delete all data and automatically return to the criterion paired comparison value.

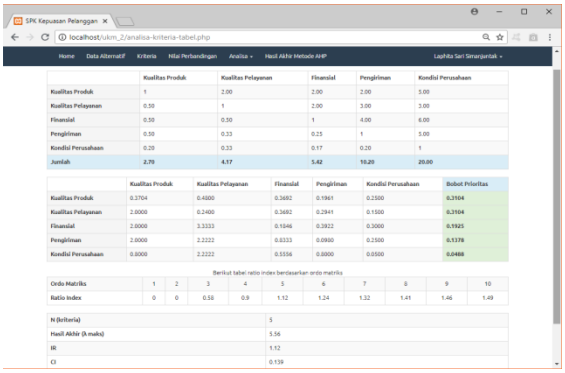

Figure 7. Criteria Comparison Form Display

h. Alternative Comparison Form Display

This form is a display for the calculation results of the comparison value for the alternatives that have been entered from the alternative analysis so that the priority value is obtained. There is one button, namely the delete all data button which functions to delete all data and automatically return to the alternative paired comparison value.

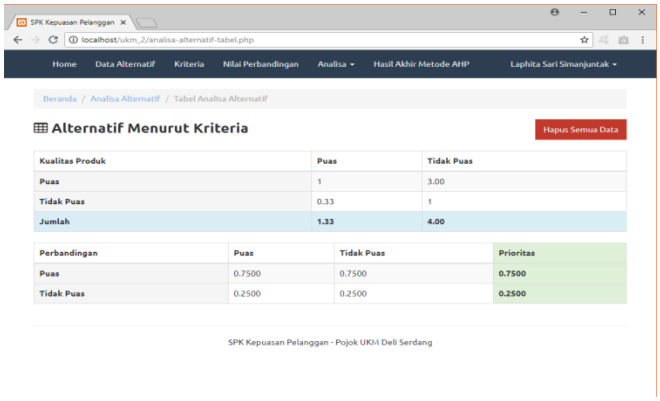

Figure 8. Alternative Comparison Form Display

By using the AHP method, it was found that the final result was that satisfied had higher than dissatisfied. This means that SME Corner customers are satisfied in terms of product quality, service quality and company conditions in the SME Corner

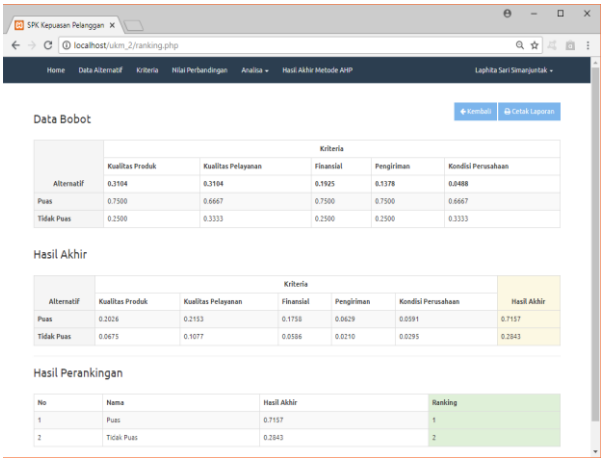

Figure 9. AHP Method Final Result Form Display

The form above is the final result of the AHP calculation. Where there is a back button to re-process the new data. The final result shows that satisfied has the highest score so that it can be stated that the customer satisfaction level of the SME Corner is more than 70%.

4. CONCLUSION

Based on the discussion regarding the determination of the decision support system in determining the level of customer satisfaction using the AHP method, the conclusions obtained; By using the AHP method, it is found that the level of customer satisfaction reaches 0.7258 or 72.58%.

Based on the calculation of AHP, the priority of the most important criteria in determining the level of customer satisfaction is obtained, where product quality and service quality are the main priority in determining the level of customer satisfaction.

Determining the level of customer satisfaction using the Analytical Hierarchy Process (AHP) method can help companies determine the extent of customer satisfaction and dissatisfaction with the facilities provided by the UKM Corner to their customers. So with the AHP method, it will simplify and simplify decision making by the company by considering the results of this study.

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