International Journal of Basic and Applied Science 10 (1) (2021) 16-23

Published by:IOCSCIENCE

International Journal of Basic and Applied Science

Journal homepage:www.ijobas.pelnus.ac.id

Decision Support System for Determining Overtime Employees at PT. Mark Dynamics Indonesia, Tbk with Analytical Hierarchy Process Method

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Article Info

Article history:

Received Apr 10, 2021
Revised Apr 28, 2021
Accepted May 20, 2021

***Keywords*:**

Decision Support System;
Employee Overtime;
Analytical Hierarchy Process;
Microsoft Visual Basic 2010;
Microsoft Access 2010.

ABSTRACT

In the company, it is necessary to conduct an assessment in order to provide overtime for employees. How to determine overtime for employees at PT. Mark Dynamics Indonesia is still manual so it is difficult to determine the assessment and determine which employees deserve overtime. This research 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, the AHP (Analytical Hierarchy Process) method is used to determine the employee overtime. In this case, the decision-making system can provide convenience for PT. Mark Dynamics, Tbk to determine customer employees in improving the quality to determine customer employees who are applied using Microsoft Visual Studio 2010 and Microsoft Access 2010 programming as databases. 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

Talking about working overtime, then talking about a situation and or work activity that starts from a company that is required to pursue production targets to increase the company's output in the market where one way to realize this is by asking to hurry or workers to do their work outside normal hours [1] [2] . Normal here can be interpreted that workers work longer hours in a company is a sequence of work activities whose length of time deviates from what it should be.

In essence, overtime work is a right for workers or laborers. The meaning of these rights is that workers can decide and choose whether to do overtime work as requested by the company. The policy of requesting for overtime work is an option by companies that is indeed allowed according to

labor laws in Indonesia because there are reasons or factors that require companies to ask for overtime work. workers to work outside normal working hours [3] [4].

PT. Mark Dynamics Indonesia, Tbk is a company that manufactures former gloves. PT. Mark Dynamics Indonesia's address is KIM Star, Jalan Pelita Barat No. 2, Tanjung Morawa. Here what will be analyzed is the determination of overtime employees who work at PT. Mark Dynamics Indonesia, Tbk.

The problem that exists in PT. Mark Dynamics Indonesia, Tbk is in determining overtime for employees. In a company, it is necessary to conduct an assessment in order to provide overtime for employees. How to determine overtime for employees at PT. Mark Dynamics Indonesia is still manual so it is difficult to determine the assessment and determine which employees deserve overtime.

Seeing the reality, the author tries to provide the right solution for smoothness in determining overtime employees based on employee performance using the Analytical Hierarchy Process method at PT. Mark Dynamics Indonesia, Tbk. The advantage of the Analytical Hierarchy Process is that it makes it easier to calculate performance criteria based on priority considerations which can make it easier to determine overtime employees [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 considerations 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. 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 [10] [11] [12].

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 [13] [14] :

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 [15]. 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 present, the result is called max.

e. Calculate Consistency Index (CI),with the formula:

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

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

The main menu display is active, 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 main menu display 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:

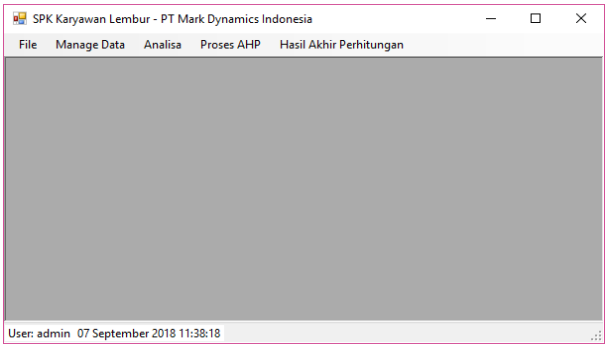

Figure 2. Home Form Display

c. Criteria Data Form

The criteria data input form serves to input the criteria for determining overtime employees. This form has 5 buttons, namely: search to find criteria that have been inputted, add to add criteria, change data to change criteria, delete to delete criteria and exit to exit the menu.

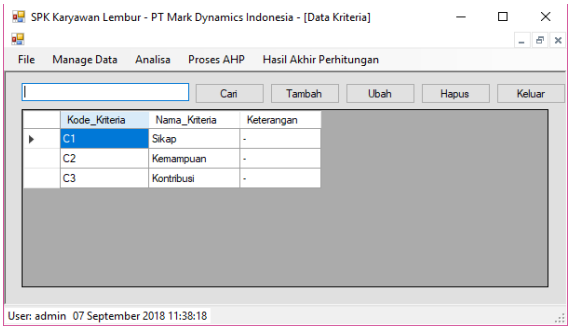

Figure 3. Criteria Data Form Display

d. Alternative Data Form Display

The alternative data input form serves to input alternatives for determining overtime employees. This form has 5 buttons, namely: search to find alternatives that have been inputted, add to add alternatives, change data to change alternatives, delete to delete alternatives and exit to exit the menu.

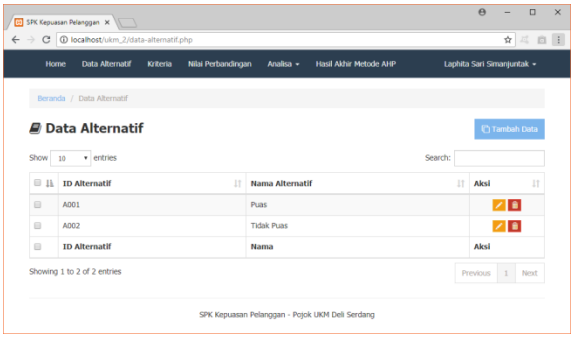

Figure 4. Alternative Data Form Display

e. Display of Criteria Paired Comparison Form

This view is used to enter comparison values between criteria from the criteria data that have been entered. From also functions to process criteria data and also row and column values so that they get priority weights. In this form there are 3 buttons, namely the refresh button to

refresh the inputted value data, save changes to save the inputted value data and the exit button to exit the menu.

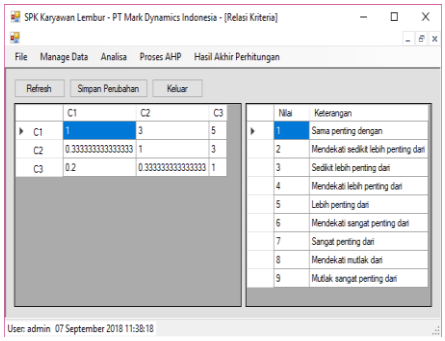

Figure 5. Display of Criteria Paired Comparison Form

f. Alternative Paired Comparison Form Display

This view is used to enter the comparison values between alternatives from the alternative data that has been entered. From also functions to process alternative data and also row and column values so that they get priority weights. In this form there are 3 buttons, namely the refresh button to refresh the inputted value data, save changes to save the inputted value data and the exit button to exit the menu.

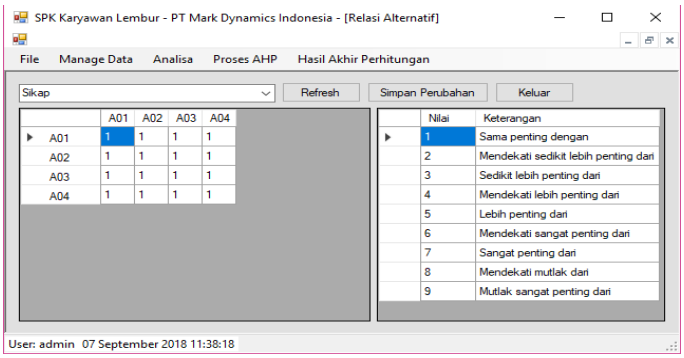

Figure 6. Alternative Paired Comparison Form Display

g. AHP Process Form Display

This process form is a display for the calculation results of the comparison value for criteria and alternatives that have been entered from the analysis of criteria and alternatives.

1) Comparison Matrix Form

This form displays the results of the comparison of values between criteria and alternatives that have been entered. After the comparison value is entered, the system will calculate the number of each column and will be displayed in this form. For testing from this form, the results displayed are in accordance with the comparison values entered and the summation is correct.

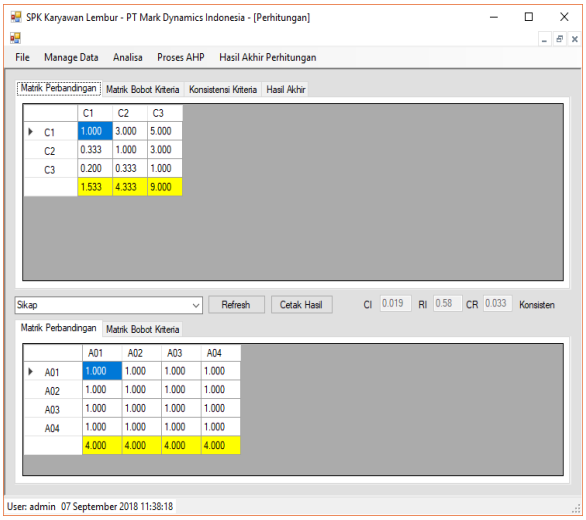

Figure 7. Comparison Matrix Form Display

2) Criteria Weight Matrix Form Display

This form displays the weight of the criteria where the weight of the criteria is generated from the multiplication of each column and row by the number of each column. Values for CI, IR, and CR are already displayed on the form. For the CR value, if the value is below 0.1 then the results will be consistent. To display the form is displayed as follows:

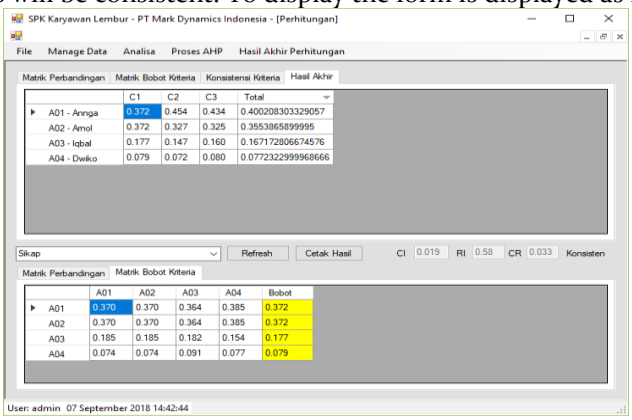

Figure 8. Criteria Weight Matrix Form Display

h. AHP Method Final Result Form Display

This form is the final result of the AHP calculation. The main output of the system contains which alternative has the highest weight so that the names of employees who have to work overtime are obtained to meet company needs. The results show that Angga has the highest score so that Angga is required to work overtime to meet the company's production needs.

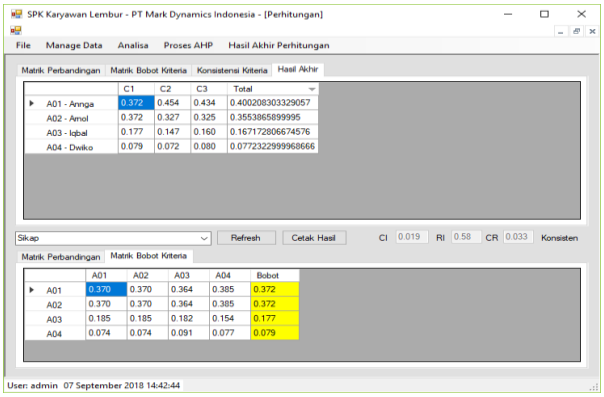

Figure 9. AHP Method Final Result Interface Display

4. CONCLUSION

Based on the discussion on determining the decision support system in determining overtime employees using the AHP method, it can be concluded that; The process of making a Decision Support System for Determining Overtime Employees can be done using the Analytical Hierarchy Process (AHP) method with the criteria and weights obtained from the interviews and then processed by the system so as to produce an output ranking of overtime employees. Based on the AHP calculation, the most important priority criteria are obtained in determining overtime employees, where attitude is the main priority in determining overtime employees. By using the AHP method, the final result is that Angga has the highest score, then Iqbal, Arnol, and Dwiko. So that the employee who deserves overtime is Angga.

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