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Decision Support System for Determining the Level of Employee Salary Increase in CV. Hera Citra Abadi by Using the Simple Additive Weghtting (SAW) Method

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ABSTRACT

In accordance with the regulations determined by the office to obtain a promotion, criteria are needed to determine who will be elected to receive promotion. Job promotion is carried out with the aim of providing feedback on the performance produced by a civil servant for a certain period. To help determine in applying someone who deserves to be promoted his position for Decision Support Systems is to use the Fuzzy Multi Attribute Decision Making (FMADM) model.
In this study a case was raised, namely looking for the best alternative based on predetermined criteria using the Simple Additive Weighting (SAW) method to calculate the FMADM model in that case. Fuzzy is used using a fuzzy system rule that is fuzzification, inference and deffuzification. This FMADM model was chosen because it is able to select the best alternative from a number of intended alternatives, namely those who have the right to choose employees to be promoted in accordance with the specified criteria. The research was conducted by looking for weight values for each attribute, then a ranking process was carried out that would determine the optimal alternative, namely the best civil servants.

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1. INTRODUCTION

Human resources in a company organization are very important to support the progress and quality of the company in achieving its goals (Ardian, 2019). An increase in employee salaries is a very important factor for employees. Seeing the current condition of CV.Hera Citra Abadi, performance appraisal of employees in the company is very necessary and has become the most important part for the purpose of improving company performance and improving the welfare of employees.

In this case CV.Hera Citra Abadi gives salary to each employee RP.1.400.000 and will increase if it reaches the sales target. The bonus also includes attitude in work, responsibility when carrying out work and no absences in 1 month. Every employee who does not work outside the leave (apsen) will be subject to a sanction in the form of a salary deduction of Rp. 40,000/apsen.

At CV.Hera Citra Abadi each employee will receive a bonus if the employee has met certain points which are still being evaluated manually which is an obstacle in terms of increasing employee salaries where employees often do not get bonuses where the employee has met the points and

ultimately affect the performance of these employees because it is difficult to determine the level of increase in employee salaries (Logahan, Tjoe, & Naga, 2012).

The development of technology and information that continuously experiences rapid progress can be utilized to facilitate all activities within the company(Ahmad, 2014). Decision support systems (Decision Support Systems) are part of a computer-based information system that is included in a knowledge-based system or knowledge management that can be used to support decision making in an organization or company. Decision support systems can help decision makers with data information that has been processed by relevant and necessary to make decisions about a problem more quickly and accurately.

Simple Additive Weighting (SAW) is a method for making decisions using various criteria and assessments for each criterion, so the basic concept of the SAW method is to find the weighted sum of the performance ratings on each alternative and on all attributes that require a normalization process. decision matrix (X) to a scale that can be compared with all available alternative ratings. The SAW method was chosen because it is able to select the best alternative from a number of alternatives based on the specified criteria (Nugraha, Surarso, & Noranita, 2012).

By using a decision support system the SAW method is estimated to be able to overcome the problems that arise in CV. Hera Citra Abadi, namely by determining the decision criteria for the level of employee salary increases, collecting employee data based on predetermined criteria so that it can be calculated using the SAW method and an application was built to make it easier to determine the level of salary increase decisions for each employee (Uni, 2018).

Beginning in October 1994, Booch, Rumbaugh and Jacobson, three of the most widely used methodological figures, pioneered efforts to unify object-oriented design methodologies. In 1995 released the first draft of UML (version 0.8). Since 1996 the development has been coordinated by the Object Management Group (OMG).

Unified Modeling Language (UML) is a language based on graphics or images for visualizing, specifying, building and documenting a software development system based on Object Oriented (Object Oriented).(Sholiq, Modeling an Object Oriented Information System with UML) (Rolly & Hakiem, 2015).

2. RESEARCH METHOD

2.1 Analysis Research methods

Several research methods were carried out by the author in order to collect data. Several research methods were carried out by the author in order to collect the data needed for research needs. Among them is by way of observations made by the author directly at the research site. For more details below, the authors explain the research methods that the authors use, namely: correlational; evaluation; survey; case study; basic theory.

2.2 Description of the Simple Additive Weighting (SAW) Method

The SAW method is often also known as the weighted addition method. The basic concept of the SAW method is to find the weighted sum of the performance ratings for each alternative on all attributes. The SAW method requires the process of normalizing the decision matrix (X) to a scale that can be compared with all existing alternative ratings. The formula for the Simple Additive Weighting (SAW) method can be seen below:

$$r_{ij} = \begin{cases} \frac{x_{ij}}{\underset{i}{Max}\, x_{ij}} \; Jika\ j\ adalah\ attribut\ keuntungan\ (benefit) \\ \frac{\underset{i}{Min}\, x_{ij}}{x_{ij}} \; jika\ j\ adalah\ attribut\ biaya\ (cost) \end{cases}$$

SAW Method Formula

Source :Kusumadewi, Fuzzy Multi-Attribute Decision Making, 2006 Page 74 Description:

rij = normalized performance rating value
xij = attribute value owned by each criterionMax
xij = the largest value of each criterion
Min xij = the smallest value of each criterion

benefits = if the largest value is the best
cost = if the smallest value of t is the best

Where rij as the normalized performance rating of alternative Ai on attribute Cj ; i=1,2,…,m and j=1,2,…,n . The preference value for each alternative (Vi) can be seen below:

$$V_i = \sum_{j=1}^{n} W_j \; r_{ij} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

SAW Metode Method Preference Formula

Description:

Vi = ranking for each alternative
Wj = weight value of each criterion
rij = normalized performance rating value
A larger Vi value indicates that alternative Ai is preferred.

3. RESULTS AND DISCUSSIONS

3.1 System Implementation

Before implementing the system created, it is necessary to pay attention to the needs of the software and hardware requirements to maintain the stability and smoothness of the system when it is run.

3.2 System implementation stages

To implement the system, it is necessary to carry out the stages of implementation, namely as follows:

a. Login Form
The login form is required for authentication of users who may and may not use the system, the system that is allowed to access the system is a user who has a username and password obtained from the administration system.

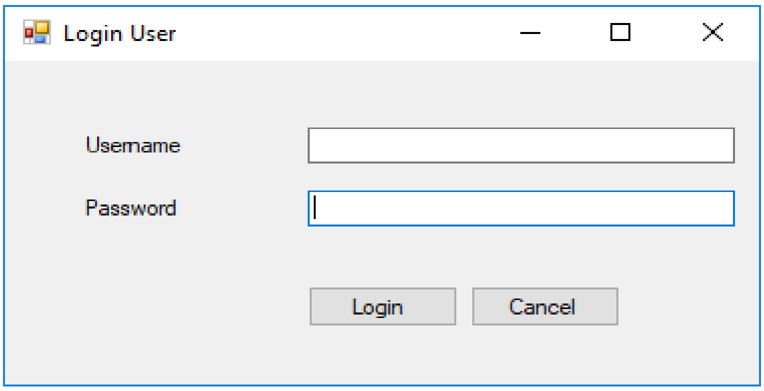
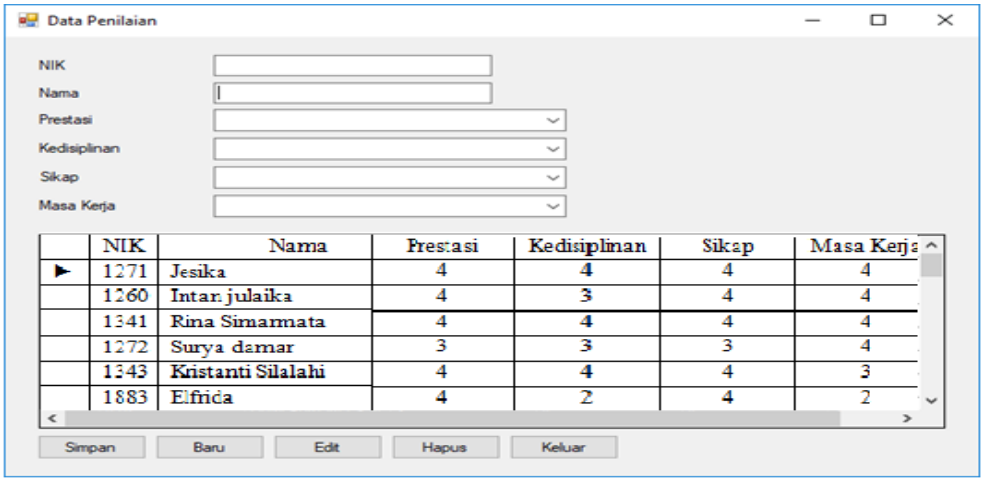


Figure 1. Login Form

b. Rating Data
The assessment data form can be accessed from the main menu form by clicking on the file menu and the assessment data. While the function of the assessment data is to conduct an assessment of each criterion for each employee, the assessment is carried out by filling in the criteria numbers which can be seen in the fuzzy table in the previous chapter. The numbers in the criteria column will directly affect the ranking results resulting from calculations using the SAW method.

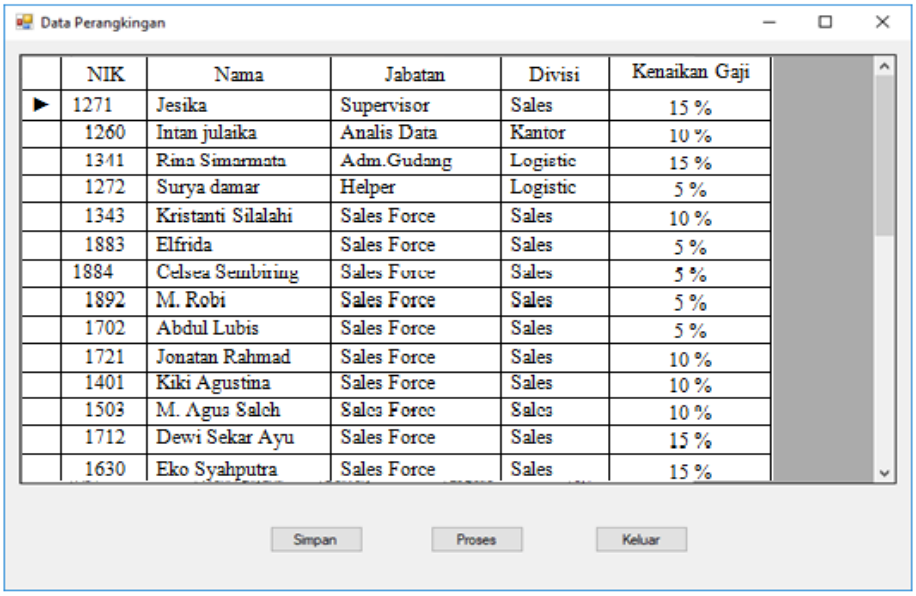


	NIK	Nama	Prestasi	Kedisiplinan	Sikap	Masa Kerja
►	1271	Jesika	4	4	4	4
	1260	Intan julaika	4	3	4	4
	1341	Rina Simarmata	4	4	4	4
	1272	Surya damar	3	3	3	4
	1343	Kristanti Silalahi	4	4	4	3
	1883	Elfrida	4	2	4	2

Figure 2. Assessment Data Form

c. Ranking Data

The ranking data form can be accessed from the main menu form by clicking on the process menu and ranking data. While the function of the ranking data form is to calculate and see the highest ranking data as indicated by the percentage increase in salary, the largest salary increase is 0.15 or equal to 15%, while a 0.1 increase in line is the same as a 10% increase in salary.



	NIK	Nama	Jabatan	Divisi	Kenaikan Gaji
►	1271	Jesika	Supervisor	Sales	15 %
	1260	Intan julaika	Analis Data	Kantor	10 %
	1341	Rina Simarmata	Adm.Gudang	Logistic	15 %
	1272	Surya damar	Helper	Logistic	5 %
	1343	Kristanti Silalahi	Sales Force	Sales	10 %
	1883	Elfrida	Sales Force	Sales	5 %
	1884	Celsea Sembiring	Sales Force	Sales	5 %
	1892	M. Robi	Sales Force	Sales	5 %
	1702	Abdul Lubis	Sales Force	Sales	5 %
	1721	Jonatan Rahmad	Sales Force	Sales	10 %
	1401	Kiki Agustina	Sales Force	Sales	10 %
	1503	M. Agus Salch	Sales Force	Sales	10 %
	1712	Dewi Sekar Ayu	Sales Force	Sales	15 %
	1630	Eko Syahputra	Sales Force	Sales	15 %

Figure 3. Employee Page

From the results of tests carried out on the system and comparing it with the results of manual calculations, it can be seen that the results of the two calculations are the same and there is no difference at all, it can be concluded that the system built is running as expected or in accordance with the specified goals.

4. CONCLUSION

The conclusions obtained from writing this thesis are as follows The process of determining the level of salary increases begins with inputting employee data, inputting assessment data then processing by ranking until results are obtained and then the rate of increase is determined, after which the increase (output) is processed in the form of a report.The application of the Simple Additive Weighting (SAW) method in making decisions to determine the level of salary increases is done by finding the weighted sum of the criteria for each alternative and on the attributes that require normalization of the decision matrix, then a ranking process is carried out to the preference value to determine the alternative that gets an increase. salary between 5% - 15% or not getting a raise at all.

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