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## EMPLOYEE POSITION MUTATIONS DECISION SUPPORT SYSTEM WITH AHP AND SAW METHODS

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Employees are important assets for every company, because they greatly influence many aspects of determining the success of the company's work. A company will be able to carry out all its business processes properly if all its employees can be well organized by the HR (Human Resources) section. Placement and utilization of resources in the right position is absolutely necessary. From the results of the study it can be concluded, among others: The application of a decision support system that is built can provide convenience and minimize errors that may occur in the process of determining employee positions. criteria for determining employee positions. The level of accuracy of the test results is 100%.

Keywords: AHP, SAW, Employee Position Mutations

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### 1. Introduction

Along with the development of Human Resources (HR) both in terms of quantity and quality, the greater the demand for HR management to carry out comprehensive and sustainable management. One of the important parts in the management and development of human resources is the system in the process of selecting prospective employees which aims to fill vacant positions in a company with the most suitable candidates (Devi Martha Ariyanti, et al., 2015: 62)

Employees are important assets for every company, because they greatly influence many aspects of determining the success of the company's work. A company will be able to carry out all its business processes properly if all its employees can be well organized by the HR (Human Resources) section. Placement and utilization of resources in the right position is absolutely necessary. In this case, proper management and utilization of resources plays a very important role because it is a strategic approach to improving organizational performance.

Determination of employee positions in the company is still not effective because the job analysis in the employee placement section is not carried out properly so that employees do not know for sure the work he does in the company. In addition, many employees are not experts in the field of work they hold so that what they do on a daily basis is not in accordance with their abilities. Dody Pernadi, et al. (2015) The application of a decision support system with the AHP method can be applied. The value of employee performance and employee ratings generated by this application can be accounted for because the calculations use the consistent AHP method. Ni Kadek Putri Ariani, I Made Gede Sunarya (2016) The implementation of a decision support system application using the AHP method to provide property recommendations resulted in software that is able to provide standard information for users in the form of information about property lists. Tomy Reza Adianto, et al. (2017) The application of the SAW method is able to provide the best alternative in determining housing. The decision support calculation process using the SAW method in the system is in accordance with manual calculations which provide the best alternative in choosing a house in Samarinda.

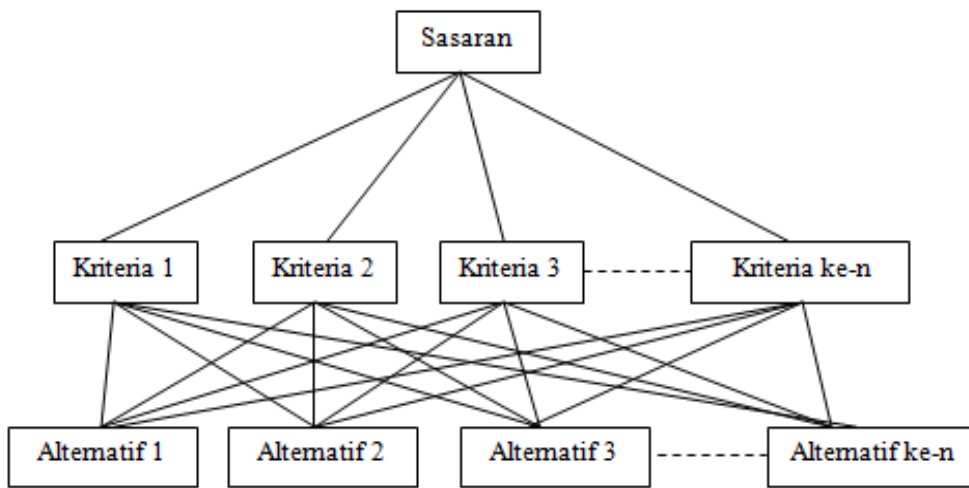
Yogha Radhitya, et al. (2016) The Decision Support System for Determining Scholarship Recipients with the SAW Method at SDN Wonoyoso succeeded in determining the order (priority) of students who are eligible and eligible to receive scholarships.

**2. Method**

Analytical Hierarchy Process (AHP) is a method of supporting decision making developed by Thomas L., when in 1980. AHP is a decision maker that describes a complex problem in the hierarchical structure with many levels consisting of objectives, criteria, and alternatives. The hierarchy is defined as a representation of a complex problem in a multilevel structure where the first level is the goal, which is followed by the level of factor, criteria, subcriteria, and so on down to the last level of the alternative. With a hierarchy, a complex problem can be described into its groups which are then arranged into a form of hierarchy so that the problem will appear more structured and systematic.

Basically, the procedure or rare AHP method includes (Syahrani Dhimas Prabowo, Eko Budi Setiawan, 2013: 29):

1. Define the problem and determine the desired solution, then compile a hierarchy of the problems faced. The preparation of the hierarchy is to set goals which are the target of the system as a whole at the top level.



**Figure 1. AHP hierarchical structure**  
(Source: Syahrani Dhimas Prabowo, Eko Budi Setiawan, 2013)

The basic concept of the SAW method is to find the weighted sum of the performance ratings on each alternative of 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. Given the following equation:

$$r_{ij} = \frac{x_{ij}}{\text{Max } x_{ij}} \text{ Jika } j \text{ atribut keberuntungan (benefit)} \dots\dots\dots(1)$$

$$r_{ij} = \frac{\text{Max } x_{ij}}{x_{ij}} \text{ Jika } j \text{ atribut biaya (Cost)} \dots\dots\dots(2)$$

Dimana  $r_{ij}$  adalah rating kinerja ternormalisasi dari alternatif  $A_i$  pada atribut  $C_j$  ;  $i=1,2,\dots,m$  dan  $j=1,2,\dots,n$ . Nilai preferensi untuk setiap alternatif ( $V_i$ ) diberikan sebagai berikut :

$$V_i = \sum_{j=1}^n w_j r_{ij} \dots\dots\dots(3)$$

Information:

$V_i$  = preference value

$w_j$  = ranking weight

$r_{ij}$  = normalized performance rating

A larger  $V_i$  value indicates that alternative  $A_i$  is more chosen (Putu Angga Septiana Putra, et al., 2016: 3-4).

### 3. Results and Discussion

As for at this stage determining the weighting of values using the ahp method, here are some employees, K001, K002, K003 with the criteria of attitude/behavior, thinking ability, practical logic, responsibility, creative imagination, achievement. From the results of the calculation of the steps above, the weights for each criterion can be seen in table 1

Table 1.  
Weight Value of Each Criteria

Kriteria	Bobot
Sikap/Perilaku	0.38
Kemampuan Berfikir	0.24
Logika Praktis	0.15
Tanggung Jawab	0.11
Imajinasi Kreatif	0.08
Prestasi	0.05

After obtaining the weight values for each criterion, the next step is to perform calculations for determining the position of office using the SAW method. Furthermore, there are 3 examples of employees who are alternatives in determining the position of the position, each of which will be determined by the position which can be seen in table 2

Table 2.  
Table of Alternative Values in Each Criterion

Alternatif	Kriteria					
	C1	C2	C3	C4	C5	C6
Samuel Sinaga	80	80	100	80	80	80
Ibrahim Tibri	60	60	60	50	80	60
Rendy Prayuga	60	80	80	80	60	80

The next step is normalization:

$$r_{11} = \frac{80}{\max \{80;60;60\}} = \frac{80}{80} = 1$$

$$r_{21} = \frac{60}{\max \{80;60;60\}} = \frac{60}{80} = 0.75$$

$$r_{31} = \frac{60}{\max \{80;60;60\}} = \frac{60}{80} = 0.75$$

$$r_{12} = \frac{80}{\max \{80;60;80\}} = \frac{80}{80} = 1$$

$$r_{22} = \frac{60}{\max \{80;60;80\}} = \frac{60}{80} = 0.75$$

$$r_{32} = \frac{80}{\max \{80;60;80\}} = \frac{80}{80} = 1$$

$$r_{13} = \frac{100}{\max \{100;60;80\}} = \frac{100}{100} = 1$$

$$r_{23} = \frac{60}{\max\{100;60;80\}} = \frac{60}{100} = 0.6$$

$$r_{33} = \frac{80}{\max\{100;60;80\}} = \frac{80}{100} = 0.8$$

$$r_{14} = \frac{80}{\max\{80;50;80\}} = \frac{80}{80} = 1$$

$$r_{24} = \frac{50}{\max\{80;50;80\}} = \frac{50}{80} = 0.63$$

$$r_{34} = \frac{80}{\max\{80;50;90\}} = \frac{80}{80} = 1$$

$$r_{15} = \frac{80}{\max\{80;80;60\}} = \frac{80}{80} = 1$$

$$r_{25} = \frac{80}{\max\{80;80;60\}} = \frac{80}{80} = 1$$

$$r_{35} = \frac{60}{\max\{80;80;60\}} = \frac{60}{80} = 0.75$$

$$r_{16} = \frac{80}{\max\{80;60;80\}} = \frac{80}{80} = 1$$

$$r_{26} = \frac{60}{\max\{80;60;80\}} = \frac{60}{80} = 0.75$$

$$r_{36} = \frac{80}{\max\{80;60;80\}} = \frac{80}{80} = 1$$

The results of normalization can be seen in the following matrix:

$$R = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 & 1 \\ 0.75 & 0.75 & 0.6 & 0.63 & 1 & 0.75 \\ 0.75 & 1 & 0.8 & 1 & 0.75 & 1 \end{bmatrix}$$

The next step is to calculate the final value.

$$\begin{aligned} V_1 &= (1*0.38) + (1*0.24) + (1*0.15) + (1*0.11) + (1*0.08) + (1*0.05) \\ &= 0.38 + 0.24 + 0.15 + 0.11 + 0.08 + 0.05 \\ &= 1.01 \end{aligned}$$

$$\begin{aligned} V_2 &= (0.75*0.38) + (0.75*0.24) + (0.6*0.15) + (0.63*0.11) + (1*0.08) + (0.75*0.05) \\ &= 0.29 + 0.18 + 0.09 + 0.06 + 0.08 + 0.03 \\ &= 0.742 \end{aligned}$$

$$\begin{aligned} V_3 &= (0.75*0.38) + (1*0.24) + (0.8*0.15) + (1*0.11) + (1*0.08) + (0.75*0.05) \\ &= 0.29 + 0.24 + 0.12 + 0.11 + 0.08 + 0.04 \\ &= 0.865 \end{aligned}$$

Tabel 3.  
Decission

Nilai	Jabatan
0.95 - 1.01	Manager
0.9 - 0.9499	Section Head
0.85 - 0.8999	Site Suvervisor
0.8 - 0.8499	Finance Staf
0.75 - 0.7999	Tax Staf
0.7 - 0.7499	Staff

0.65 - 0.6999	Account Executive
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The final assessment of the determination of the position of office is based on the decision table, in determining the position of the position the final value of the calculation of SAW.

#### 4. Conclusions

From writing a thesis entitled Decision Support System for Determining Employee Position Using AHP and SAW Methods, the following conclusions can be drawn The application is built using the Visual Basic 2010 programming language and SQL Server 2008 R2 database, making it easier for users to use it, The decision support system application that is built can provide convenience and minimize errors that may occur in the process of determining employee positions, The combination of AHP and SAW methods in the built decision support system is able to provide final results in accordance with the criteria for determining employee positions. The level of accuracy of the test results is 100%.

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