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Providing Best Employee Rewards using Decision Support System Method

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Abstract: Employees are people who deserve to be maintained in a company. Each employee has the duties and functions of each work. To maintain the level of employee performance, every company always gives rewards to employees nominated according to the company. Employees who get rewards are individual employees who work hard and have high competitiveness so they can excel in various situations. However, the company experienced problems in determining which employees were eligible to receive rewards. Decision support systems can be used to assist companies in determining or recommending which employees are eligible for compensation. The Simple Additive Weighting (SAW) method is one of the proper methods used to provide recommendations for evaluating outstanding employees. Several criteria can determine how decent the employee is. By applying the SAW method, it is expected that companies can determine employees who are eligible to receive fair and equitable rewards. Employees can obtain eligibility with transparent values , thereby reducing the level of suspicion among fellow employees.

Keywords: reward, best, employee, DSS, SAW

1. INTRODUCTION

A reward is something that is given because of something, for example, because someone has behaved well, worked hard, or provided services to the community. Rewards can also be in the form of money offered to anyone who can provide information or provide more performance for a company. Everyone can have the opportunity to get the reward that will be given. Every company, especially a large company, often gives rewards for the achievements of its employees. Usually, this reward will be given because the achievement of a target has been successful. However, not all employees are eligible or suitable to receive rewards or rewards for their services. Only individual employees have the opportunity to receive rewards as an effort to achieve.

Determining whom the employees deserve in return is not easy. Individual assessments are needed so that the calculation results are correct and fair. Several criteria can be used as a guide in assessing people who are registered as recipients of these benefits. This problem requires a solution and solution so that the determination can work well. One way is to create a decision support system to determine which employees are eligible for compensation. The aim is to assist in the decision making process in increasing accuracy and deciding on solutions. Decisions made will be accurate and fair.

The Simple Additive Weighting (SAW) method is one of the decision support system methods that can be used to provide an assessment and recommendation of which employees are entitled to get rewards in a company so that company owners can find out which employees have excellent performance [1]. The results of this calculation are expected to provide a reference for looking for employees in a company that has high hard work.

2. THEORIES

2.1 Simple Additive Weighting

The SAW method is often also known as the weighting of the sum method. The basic concept of the SAW method is to find the number of weighted performance ratings for each alternative on all attributes. The SAW method requires the process of normalizing the decision matrix (X) to a scale proportional to all current alternative ranks [2].

Simple Additive Weighting (SAW), also known as a linear weighted combination or valuation method, is the simplest and most frequently used multi-attribute decision technique. This method is based on a weighted average. An evaluation score is calculated for each alternative by multiplying the scale value given to the alternative attribute by the relative importance weights directly assigned by the decision-maker, followed by adding up the product for all criteria. The advantage of this method is the proportional linear transformation of raw data, which means that the relative order of the standard score remains the same. The SAW process consists of these steps:

The formula for normalization is as follows:

$$Rij = \begin{cases} \dfrac{X_{ij}}{Max\ X_{ij}} \\ \dfrac{Min\ X_{ij}}{X_{ij}} \end{cases}$$

Information:

Rij	:	Performance changes performance ratings.
Maxij	:	The maximum value of each row and column.
Minij	:	Minimum value for each row and column.
Xij	:	Row and column matrix.

With Rij is a normalized performance rating from alternative Ai. The preference value for each alternative (Vi) is given as:

$$Vi = \sum_{j=1}^{n} Wjr_{ij}$$

Information:

Vi	:	The final value of the alternative
Wj	:	Weight specified
Rij	:	Normalization matrix

A higher Vi value indicates that the Ai alternative is preferred.

The advantage of the simple additive weighting method compared to other decision-making models lies in its ability to carry out more precise assessments because it is based on predetermined values and weighting preferences.

2.2 Definition of Reward

A reward is an incentive plan to reinforce the desired behavior of workers or employers and, in return, for their services to the organization. Rewards can be in the form of money in the form of salary or non-money in the form of rewards for some specialized services for the company or just giving the employee the job he likes. The primary purpose of organizations in giving awards is to attract, retain, and retain employees who are efficient, high-performing, and motivated [3].
There may be various types of awards that an organization can give to its employees, such as money, value, performance-based incentives or performance payments, increases, rewards cards, recognition or rewards, benefit-sharing, vacation packages, medical protection, promotions, bonuses, etc. Rewards are given primarily to reward employee performance and motivate them. It is because motivated workers lead to higher productivity and overall organization. On the other hand, if workers are not motivated, they can cause organizational failure by disrupting and motivating other workers as well. Rewards are considered separate from salary but can be in the form of money and have costs for the company [4].

Rewards are generally aligned with organizational goals when an employee helps the organization to achieve one of the organizational goals it achieves.
Rewards can be categorized into two types, such as:

1. Intrinsic Rewards
   Intrinsic rewards are rewards that satisfy employees internally. Only money is not enough to motivate people, and it is essential to make people aware of their contribution to organizational problems. Intrinsic rewards can be given meaningful work for employees, give employees autonomy, enable employees to take responsibility in their areas of expertise and provide development opportunities to employees
2. Extrinsic rewards.
   Unlike intrinsic rewards, most tangible rewards are wages, progress, recognition, and time off.

2.3 Definition of Employees

An employee is an individual who is employed by an employer to do specific jobs. The employer hires the worker after the application and interview process results in his choice as an employee. This selection occurs after the applicant is found by the employer as the most qualified applicant to do the job. It is always the risk that employers take because they need to hire people who can do the work needed to do specific jobs. The candidate only learns a lot in the interview and selection process [5].

The conditions of employment of a person are determined by a letter of offer, employment contract, or verbally. At workplaces that are not workplaces, each employee negotiates based on their respective work conditions. Many do not negotiate at all by choosing to accept offers that employers give them. Others ask for $ 5,000 more to see if they can start with a higher salary. In the workplace represented by the union, collective bargaining agreements cover most aspects of the employee's relationship with the workplace, including compensation, benefits, working hours, sick leave, and holidays. The contract also protects the rights of unionized employees and gives employees the option to grieve over treatment at work. The existence of a contract removes the individual employee's right to negotiate his salary. Most employees who work in a service or product creation role have a narrow range of potential salary offers because their work is determined by the salary range and benefits in mind. Employees who are senior leaders and managers are more likely to accept their job offers in employment contracts [6].

3. METHODOLOGY

3.1 Assessment Criteria

Criteria are assessed through weights. For various problems, a scale of 1 to 5 is the best scale in determining weights as in table 1.

Table 1. Rating Scale

Score	Value
1	Sangat Rendah
2	Rendah
3	Cukup
4	Baik
5	Sangat Baik

The assessment is carried out based on the policy of decision-makers by assessing the importance of a criterion. The assessment process starts at the top level of the hierarchy, which is intended to select criteria. To determine the value of element weights, used a scale of numbers from 1 to 5.

3.2 Research Stages

This research consists of several stages. This study was conducted based on data obtained by the requirements of how to obtain a reward in the company based on existing references. The data processing method to get a ranking of some employees who test will be processed using a decision support system with the SAW method. The ranking process is in the form of employees who are entitled to receive rewards for business and work in a company. The following are the stages of the research carried out:

1. Literature Study
   This stage is carried out searching for sources related to giving rewards. Material sources can be obtained from the internet and from the author's observations based on reading material that explains the theory of rewards.
2. Analysis
   This stage is the process of analyzing the problem and determining the resolution model for the problem discussed. This stage consists of an analysis of the problems that occur and how to solve them. Criteria will be created to determine the conditions determining the provision of rewards for employees in a company.
3. Discussion
   In this section, the SAW process will be tested based on the weight of preferences that have been made in the design criteria.
4. Implementation and testing
   This stage is the testing of an application program that has been made to determine the results of the SAW process in determining which employees are eligible for compensation.

3.3 Stages of Data Collection

This stage is part of collecting data, including searching for information relating to the SAW method for providing rewards to employees to match the desired results. Data collection methods in this writing are divided into three, such as:

1. Literature Study
   The literature study is done by collecting data, studying, and reading various materials from several sources such as books, journals, papers, the internet, and various other sources to obtain information.
2. Interview
   Interviews were conducted by getting information directly to people who understood about the SAW method and to people who had much knowledge about giving rewards to the marchers. The results of this interview can determine what criteria are suitable to be used in determining employees who deserve to be rewarded.
3. Observations

Observations are made by looking at the compatibility of the criteria used with events that occur in a company in determining employees who deserve to be rewarded.

3.4 Criteria Weighting

Criteria are the conditions used to determine the eligibility of employees to receive compensation from the company. In this study, six criteria will be created that serve as benchmarks for the company's assessment of employees who are included in the recipient candidates of the company. The criteria include:
1. Presence (C1)
2. Discipline (C2)
3. Niceness (C3)
4. Working Hours (C4)
5. Test Value (C5)
6. Attendance (C6)

Each criterion has a different notation. From these six criteria, five criteria are of type Benefit and a criterion of type Cost. Each criterion will be categorized in the range of values from 0 to 5 to facilitate calculations in the SAW formula. The following are the criteria categorization tables to get the simplification value.

4. RESULT AND DISCUSSION

4.1 Preferenced Weight

Preferential weight is a reference in which direction a criterion is emphasized. This preference weight is also a comparison of strengths among all weights. Not all criteria weights are of equal or equal importance. Some have bigger interests, some are smaller, and some are equally flat. In determining preference weights, one must know the extent of the importance of these weights. The following table is an example of setting a preference weight.

Table 2. Preferenced Weight

Kriteria	Bobot
Presence (C1)	3
Discipline (C2)	5
Niceness (C3)	2
Working Hours (C4)	4
Test Value (C5)	4
Attendance (C6)	4

4.2 Calculation

The test is to test the results of the calculation of decision support systems for the value of the SAW calculation. Testing is done by two methods, manual and application program. The results issued by the two methods must be of equal value so that the application program and the manual calculation are correct. The formula applied to the two methods must be the same so that errors do not occur in the calculation. Before carrying out calculations, several parts need to be prepared, such as alternative data, criteria, and criteria weights, which will then be processed by the SAW method. The following is a complete test to get a SAW score and provide recommendations to which company employees are eligible for compensation.

Table 3. Alternative Data

Alternative	C1	C2	C3	C4	C5	C6
Susi Susilawati	5	3	2	4	3	4
Handoko Permana	4	3	2	1	4	3
Agus Susanto	3	5	5	2	2	4
Roni Gunawan	4	4	3	4	3	3
Hendra Willam	3	3	2	5	5	4
Roy Martin	5	5	3	2	2	3
Reni Maharani	4	4	2	5	5	1
Budi Hernawan	3	2	2	1	4	4
Ismail Rinaldi	3	5	3	3	3	4
Marina Andriani	1	4	2	2	2	4

Table 2 is the data used to determine employees who are entitled to receive compensation from the company. In this data, it can be seen that there are six criteria used to implement the SAW method. Each criterion is filled with values according to the range of values in the design criteria. The value must be normalized based on the preference weights that have been described in the designation of the criteria weights. Table 4 is the result of normalization criteria.

Table 4. Criteria After Normalization

Alternative	C1	C2	C3	C4	C5	C6
Susi Susilawati	5/5	3/5	2/5	4/5	3/5	1/4
Handoko Permana	4/5	3/5	2/5	1/5	4/5	1/3
Agus Susanto	3/5	5/5	5/5	2/5	2/5	1/4
Roni Gunawan	4/5	4/5	3/5	4/5	3/5	1/3
Hendra Willam	3/5	3/5	2/5	5/5	5/5	1/4
Roy Martin	5/5	5/5	3/5	2/5	2/5	1/3
Reni Maharani	4/5	4/5	2/5	5/5	5/5	1/1
Budi Hernawan	3/5	2/5	2/5	1/5	4/5	1/4
Ismail Rinaldi	3/5	5/5	3/5	3/5	3/5	1/4
Marina Andriani	1/5	4/5	2/5	2/5	2/5	1/4

Data after normalization has a weight value between 1 to 5. This weighting functions to simplify so that the calculations are carried out. The next stage is the result of the distribution of min-max according to the type of criteria used, whether Benefit or Cost. Table 5 is the result of the division after normalized data.

Table 5. Results of weighting criteria after normalization

Alternative	C1	C2	C3	C4	C5	C6
Susi Susilawati	1	0,6	0,4	0,8	0,6	0,25
Handoko Permana	0,8	0,6	0,4	0,2	0,8	0,33
Agus Susanto	0,6	1	1	0,4	0,4	0,25
Roni Gunawan	0,8	0,8	0,6	0,8	0,6	0,33

Hendra Willam	0,6	0,6	0,4	1	1	0,25
Roy Martin	1	1	0,6	0,4	0,4	0,33
Reni Maharani	0,8	0,8	0,4	1	1	1
Budi Hernawan	0,6	0,4	0,4	0,2	0,8	0,25
Ismail Rinaldi	0,6	1	0,6	0,6	0,6	0,25
Marina Andriani	0,2	0,8	0,4	0,4	0,4	0,25

Criteria after normalization must be calculated to get the vector value from SAW. The calculation process will accumulate the criterion value multiplied by the weight of the preference. There is no reduction in the calculation of the SAW value. The following table is the result of the calculation of SAW values obtained from previous criteria data.

Table 6. The calculation results

Alternative	Rank
Susi Susilawati	0,611
Handoko Permana	0,5254
Agus Susanto	0,593
Roni Gunawan	0,6614
Hendra Willam	0,663
Roy Martin	0,6274
Reni Maharani	0,872
Budi Hernawan	0,437
Ismail Rinaldi	0,629
Marina Andriani	0,437

After being sorted from the largest to the smallest, competent alternative data are obtained to obtain a credit card. In this case, if the highest three were taken who were entitled to receive compensation from the company, the names Reni Maharani, Hendra Willam and Roni Gunawan were the three people who were entitled to receive the compensation.

5. CONCLUSION

After discussing the SAW method in determining employees who are entitled to receive benefits, several conclusions can be presented from the results of this study. The SAW method is very fast in processing criteria to determine which employees are entitled to receive benefits. The preference weights can be set according to the criteria to be used. This is to achieve the flexibility to the user in determining the balance of weights. The resulting SAW weight has good accuracy when viewed from alternative data, criteria, and preference weights used. SAW can be a guideline for companies in determining employees who are eligible to get rewards from the company. The weight of preferences can be adjusted to approach the real situation to get variations in the SAW value.

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