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EMPLOYEE PERFORMANCE ASSESSMENT EVALUATION USING THE SIMPLE MULTI-ATTRIBUTE RATING TECHNIQUE (SMART) AT THE MEDAN FINANCIAL TRAINING CENTER

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ABSTRACT

Employee performance assessment is one of the important aspects to achieve the goals of an institution. With the application of information technology, a decision support system can be used to provide assessments. One method that can be used to provide employee performance assessments is the SMART (Simple Multi Attribute Rating Technique) method. This method was chosen because of its superiority in being able to solve problems using multicriteria so it is suitable for determining employee performance assessments at the Medan Financial Training Center. The criteria used in determining employee performance assessments at the Medan Financial Training Center are Discipline, Responsibility, Leadership, Innovation, Competence. Data collection was carried out using questionnaires distributed to employees at the Medan Financial Training Center. The results of the study from 20 data samples using the SMART method obtained ranking results from employee performance assessments ranging from very good assessments with a final value of 1 to very poor with a final value of 0.025.

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1. INTRODUCTION

Every company crave own high performing employees high, because employees who have performance tall will give contribution big to achievement objective company. Performance is results Work or what can done in a way that quality and quantity can achieved by a employee in carry out his duties in accordance with not quite enough the answer given to him [1] in [2]. For produce performance as expected, employees must own various required elements For reach it, like competence, achievement, discipline, motivation, responsibility answer, and so on. Elements This can drive to better performance well, because That need controlled such appearance to continue increase [3].

However so, already become nature that behavior man difficult For still be in condition constant. Behavior man always changes influenced by situations and conditions certain [4]. Control to behavior that can push or lower employee For reach better performance Good can done through an assessment process performance, namely a process in matter determination understanding together about What will achieved, as well as approach For manage and develop people with do various improvement [5]. Improvement This No Can happen only with management - controlled system For arrange performance employee them, but also through something possible approaches they For arrange development and performance they Alone in framework clear goals and standards that have been approved together supervisor they [6].

Evaluation performance in a way general can used as gauge measuring company in taking related decisions with giving bonuses, incentives, transfers employees, education and training, promotion, placement, development career even until termination employees [7]. For reason said, the assessment performance own a very important role. Therefore, the assessment performance employee need done very objectively and openly, no may done in a way subjective, one-sided, or based on likes or No Like [8].

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Need will evaluation performance employee is matter important in A institutions Because own relatedness close with every taking decisions in institutions there are Lots variables that can used in determination performance employees, depending on the needs of each institution, both That employees, staff, lecturers, and employees at the institution certain conditions [10].

There is Lots methods that can used in do calculation mark performance a employees. Research This use SMART method (Simple Multi Attribute Rating Technique) in calculation mark performance [11]. This method chosen Because users can determine weight from given criteria so that obtained alternative best assessment. Additionally, step in respond need taker decisions and methods analyze The response is also simple [12]. The SMART method is also capable of finish problem with multicriteria so that suitable used For evaluation performance that requires Lots criteria [13].

Training Center Medan Finance is an implementing unit technical Education and Training Agency Finances that are under and responsible for answer direct to Head of Education and Training Agency Finance. This institution own task For carry out education, training and upgrading state finances. During carry out activity Studying Work Practice (KKP) at the Training Center Medan Finance, writer Lots learn achievements targeted by the institution This For fulfil task principal and responsibility answered the employees [14]. The author notice How employee performance in meet daily, weekly, monthly and yearly targets. Therefore that, it is necessary existence evaluation evaluation performance employees for performance can Keep going optimized to achieve the targets that have been set set [15].

Based on matter said, the author interested take title " Evaluation Employee Performance Assessment With Using the Simple Multi Attribute Rating Technique (SMART) Method at the Training Center Medan Finance " as title report Work practice, in order to do evaluation performance employee in a way more objective and systematic at the Training Center Medan Finance.

2. RESEARCH METHOD

The focus of this study is the development of a decision support system using the SMART (Simple Multi Attribute Rating Technique) method. SMART is a multi-criteria decision-making method developed by Edward in

1997. This multi-criteria decision-making technique is based on the theory that each alternative consists of several criteria with values, and each criterion has a weight that describes how important that criterion is compared to other criteria. These weights are used to rank each option to obtain the best choice [16].

The Simple Multi-Attribute Rating Technique (SMART) is a multi-attribute decision-making method. This multi-attribute decision-making technique is used to help stakeholders choose between several alternatives. Each attribute has a value, which is averaged on a specific scale. Each attribute has a weight that describes its importance compared to other attributes. With SMART, attribute weighting is carried out in two steps, namely [17] :

a Ranking the importance of an attribute from worst to best.

b Comparing the importance ratio of each attribute with the attributes below it. SMART is more widely used because of its simplicity in responding to the needs of decision makers and the way it analyzes responses. The analysis involved is transparent, so this method provides a high level of understanding of the problem and is acceptable to decision makers. Weighting in SMART uses a scale of 0-1, which facilitates calculation and comparison of values for each alternative.

This research method is divided into several systematic stages, beginning with needs identification. At this stage, the researcher gathers various relevant materials to support the research. The information sources used are derived from literature studies, including scientific articles in national and international journals, seminar proceedings, and reference books. This step aims to gain theoretical and conceptual understanding that can serve as a foundation for designing the research [18].

The next step is the needs analysis stage. At this stage, researchers conduct an in-depth review of the previously collected data and information. This analysis aims to identify critical components directly related to the research topic and determine the variables to be used in the employee performance evaluation process. The results of this needs analysis will form the basis for developing assessment instruments and selecting relevant criteria.

The next stage is the SMART (Simple Multi Attribute) method analysis. Rating The SMART Technique is used as the primary approach in evaluating performance. This method was chosen because of its ability to solve problems involving multiple criteria. The SMART method implementation process begins by determining the number of criteria used in the assessment. After that, each criterion is weighted according to its level of importance, and then a normalization process is performed to adjust the weighting scale

The next step involves assigning a value to each criterion for each alternative (in this case, employees), then calculating a utility value to measure the extent to which the criteria are met. Once the utility value is obtained, the final score is determined by multiplying the criterion weights by the utility value of each alternative. The final step in this method is a ranking process to determine the alternative with the best value based on all the analyzed criteria.

3. RESULT AND ANALYSIS

3.1 Calculation steps for the SMART method

The calculations were carried out using the SMART method and involved 20 BDK employees from Medan, taken from two sub-divisions, namely the Administration and Internal Compliance Sub-division (TUKI) and the Learning Implementation Section. Steps calculation method SMART as following:

3.2 Determine Number of Criteria

The criteria used to determine employee performance assessments are discipline, responsibility, leadership, innovation, and competence. The criteria data can be seen in Table 1. below :

Table 1: Criteria

Code Criteria	Criteria
C1	Discipline
C2	Responsibility
C3	Leadership
C4	Innovative
C5	Competence

3.3 Determine Weight Criteria

In the stage of determining the criteria weights, the importance level is used for the weight values, each with its own description. The importance level can be seen in Table 2. below:

Table 2: Weight Criteria

Code Criteria	Criteria	Criteria
C1	Discipline	10
C2	Responsibility	25
C3	Leadership	15
C4	Innovative	20
C5	Competence	30
	Amount Weight	**100**

The table shows the evaluation criteria with their respective weights. Five criteria (Discipline, Responsibility, Leadership, Innovative, Competence) are assessed with a total weight of 100. Competence has the highest weight (30), followed by Responsibility (25), Innovative (20), Leadership (15), and Discipline (10). These weights indicate the relative importance level of each criterion in the overall evaluation.

3.4 Weight Normalization Criteria

The calculation carried out at this stage is by dividing the weight value of each criterion by the total of all weight values for the criteria in table 2. above.

$$\text{Normalisasi} = \frac{W_j}{\sum W_j} \tag{1}$$

Information

W_j = Criteria weighting value

$\sum W_j$ = Total weight of all criteria

With using equality (1) obtained calculation:

$$\text{Normalisasi } C_1 = \frac{10}{100} = 0.1$$
$$\text{Normalisasi } C_2 = \frac{25}{100} = 0.25$$
$$\text{Normalisasi } C_3 = \frac{15}{100} = 0.15$$
$$\text{Normalisasi } C_4 = \frac{20}{100} = 0.2$$
$$\text{Normalisasi } C_5 = \frac{30}{100} = 0.3$$

Results calculation normalization weight every criteria displayed like table 3. following :

Table 3: Normalization Weight Criteria

Code Criteria	Criteria	Weight Normalization
C1	Discipline	0.1
C2	Responsibility	0.25
C3	Leadership	0.15
C4	Innovative	0.2
C5	Competence	0.3

3.5 Give mark criteria For all alternative

At this stage, criteria values are assigned to each alternative. The criteria values for all alternatives can be seen in table 4. below :

Table 4: Sub Criteria And Mark Criteria

Criteria Code	Criteria	Sub Criteria	Mark
C1	Discipline	Very Good (90-100)	5
		Good (80-89)	4
		Enough Good (70-79)	3
		Not enough Good (60-69)	2
		No Good (0-59)	1
C2	Not quite enough Answer	Very Good (90-100)	5
		Good (80-89)	4
		Enough Good (70-79)	3
		Not enough Good (60-69)	2
		No Good (0-59)	1
C3	Leadership	Very Good (90-100)	5
		Good (80-89)	4
		Enough Good (70-79)	3
		Not enough Good (60-69)	2
		No Good (0-59)	1
C4	Innovative	Very Good (90-100)	5
		Good (80-89)	4
		Enough Good (70-79)	3
		Not enough Good (60-69)	2
		No Good (0-59)	1
C5	Competence	Very Good (90-100)	5
		Good (80-89)	4
		Enough Good (70-79)	3
		Not enough Good (60-69)	2
		No Good (0-59)	1

Study This use sample 20 data from employee with mark criteria as in table 5. below:

Table 5: Sub Criteria And Mark Criteria

No	Employee Name	Criteria				
		Discipline (C1)	Responsibility (C2)	Leadership (C3)	Innovative (C4)	Competence (C5)
1	Responden 1	86	80	80	80	80
2	Responden 2	93	86	80	86	80
3	Responden 3	93	86	86	93	86
4	Responden 4	93	93	80	86	86
5	Responden 5	100	100	93	93	93
6	Responden 6	80	80	86	80	80
7	Responden 7	86	73	80	80	73
8	Responden 8	100	86	86	86	86
9	Responden 9	80	80	80	86	80
10	Responden 10	73	86	73	80	73
11	Responden 11	86	80	80	80	80
12	Responden 12	80	80	86	86	86
13	Responden 13	86	93	86	86	80
14	Responden 14	80	80	80	80	80

No	Employee Name	Criteria Discipline (C1)	Responsibility (C2)	Leadership (C3)	Innovative (C4)	Competence (C5)
15	Responden 15	86	73	80	73	66
16	Responden 16	80	80	80	80	86
17	Responden 17	86	86	86	80	80
18	Responden 18	93	86	86	93	86
19	Responden 19	80	73	73	73	66
20	Responden 20	80	73	80	73	66
	Mark Min	73	73	73	73	66
	Mark Max	100	100	93	93	93

3.6 Calculation mark utility for all criteria

For get mark utility used formula as following:

$$u_i(a_i) = \left(\frac{C_{out} - C_{min}}{C_{max} - C_{min}}\right) \tag{2}$$

Where $u_i(a_i)$ is the utilityis the utility score of the 1st criterion on tChe ith criterion. C_{max} is the maximum criteria score. C_{min} is the minimum criteria score and C_{out} score of the i-th criterion With use equality (1.3) counted mark utility For every criteria, then the following results are obtained:
Criteria Discipline (C1) :

$$u_1(C_1) = \left(\frac{86-73}{100-73}\right) = \frac{13}{27} = 0.48$$
$$u_2(C_1) = \left(\frac{93-73}{100-73}\right) = \frac{20}{27} = 0.74$$
$$u_3(C_1) = \left(\frac{93-73}{100-73}\right) = \frac{20}{27} = 0.74$$
$$u_4(C_1) = \left(\frac{93-73}{100-73}\right) = \frac{20}{27} = 0.74$$
$$u_5(C_1) = \left(\frac{100-73}{100-73}\right) = \frac{27}{27} = 1$$

Criteria Not quite enough answer (C2)

$$u_1(C_2) = \left(\frac{80-73}{100-73}\right) = \frac{7}{27} = 0.25$$
$$u_2(C_2) = \left(\frac{86-73}{100-73}\right) = \frac{13}{27} = 0.48$$
$$u_3(C_2) = \left(\frac{86-73}{100-73}\right) = \frac{13}{27} = 0.48$$
$$u_4(C_2) = \left(\frac{93-73}{100-73}\right) = \frac{20}{27} = 0.74$$
$$u_5(C_2) = \left(\frac{100-73}{100-73}\right) = \frac{27}{27} = 1$$

Criteria Leadership (C3)

$$u_1(C_3) = \left(\frac{80-73}{93-73}\right) = \frac{7}{20} = 0.35$$
$$u_2(C_3) = \left(\frac{80-73}{93-73}\right) = \frac{7}{20} = 0.35$$

$$u_3(C_3) = \left(\frac{86-73}{93-73}\right) = \frac{13}{20} = 0.65$$
$$u_4(C_3) = \left(\frac{80-73}{93-73}\right) = \frac{7}{20} = 0.35$$
$$u_5(C_3) = \left(\frac{93-73}{93-73}\right) = \frac{20}{20} = 1$$

Criteria Innovative (C4)

$$u_1(C_4) = \left(\frac{80-73}{93-73}\right) = \frac{7}{20} = 0.35$$
$$u_2(C_4) = \left(\frac{86-73}{93-73}\right) = \frac{13}{20} = 0.65$$
$$u_3(C_4) = \left(\frac{93-73}{93-73}\right) = \frac{20}{20} = 1$$
$$u_4(C_4) = \left(\frac{86-73}{93-73}\right) = \frac{13}{20} = 0.65$$
$$u_5(C_4) = \left(\frac{93-73}{93-73}\right) = \frac{20}{20} = 1$$

Criteria Competence (C5)

$$u_1(C_5) = \left(\frac{80-66}{93-66}\right) = \frac{14}{27} = 0.51$$
$$u_2(C_5) = \left(\frac{80-66}{93-66}\right) = \frac{14}{27} = 0.51$$
$$u_3(C_5) = \left(\frac{86-66}{93-66}\right) = \frac{20}{27} = 0.74$$
$$u_4(C_5) = \left(\frac{86-66}{93-66}\right) = \frac{20}{27} = 0.74$$
$$u_5(C_5) = \left(\frac{93-66}{93-66}\right) = \frac{27}{27} = 1$$

Then done calculation furthermore until to 20 employee, so that the values obtained are as in table 6. Below.

Table 6: Mark Utility Criteria

		Mark Utility Criteria				
No	**Employee Name**	**Discipline (C1)**	**Responsibility (C2)**	**Leadership (C3)**	**Innovative (C4)**	**Competence (C5)**
1	Responden 1	0.48	0.25	0.35	0.35	0.51
2	Responden 2	0.74	0.48	0.35	0.65	0.51
3	Responden 3	0.74	0.48	0.65	1	0.74
4	Responden 4	0.74	0.74	0.35	0.65	0.74
5	Responden 5	1	1	1	1	1
6	Responden 6	0.25	0.25	0.65	0.35	0.51
7	Responden 7	0.48	0	0.35	0.35	0.25
8	Responden 8	1	0.48	0.65	0.65	0.74
9	Responden 9	0.25	0.25	0.35	0.65	0.51
10	Responden 10	0	0.48	0	0.35	0.25
11	Responden 11	0.48	0.25	0.35	0.35	0.51
12	Responden 12	0.25	0.25	0.65	0.65	0.74

No	Employee Name	Mark Utility Criteria Discipline (C1)	Responsibility (C2)	Leadership (C3)	Innovative (C4)	Competence (C5)
13	Responden 13	0.48	0.74	0.65	0.65	0.51
14	Responden 14	0.25	0.25	0.35	0.35	0.51
15	Responden 15	0.48	0	0.35	0	0
16	Responden 16	0.25	0.25	0.35	0.35	0.74
17	Responden 17	0.48	0.48	0.65	0.35	0.51
18	Responden 18	0.74	0.48	0.65	1	0.74
19	Responden 19	0.25	0	0	0	0
20	Responden 20	0.25	0	0.35	0	0

3.7 Calculation Mark End

The calculation carried out at this stage is by applying the formula:

$$\mathrm{NA} = u_i(a_i) = \sum_{j=1}^{m} W_j \, u_i(a_i) \tag{3}$$

Where W_j is mark weighting criteria jth and $u_i(a_i)$ is mark utility of the i-th criterion for the i-th criterion.

From results Which obtained on step previously, furthermore using the equation formula (4) the following results are obtained:

$$\begin{aligned}
\mathrm{NA1} &= u(c1)\cdot w1 + u(c2)\cdot w2 + u(c3)\cdot w3 + u(c4)\cdot w4 + u(c5)\cdot w5 \\
&= (0.48)(0.1) + (0.25)(0.25) + (0.35)(0.15) + (0.35)(0.2) + (0.51)(0.3) = 0.386 \\
\mathrm{NA2} &= u(c1)\cdot w1 + u(c2)\cdot w2 + u(c3)\cdot w3 + u(c4)\cdot w4 + u(c5)\cdot w5 \\
&= (0.74)(0.1) + (0.48)(0.25) + (0.35)(0.15) + (0.65)(0.2) + (0.51)(0.3) = 0.5295 \\
\mathrm{NA3} &= u(c1)\cdot w1 + u(c2)\cdot w2 + u(c3)\cdot w3 + u(c4)\cdot w4 + u(c5)\cdot w5 \\
&= (0.74)(0.1) + (0.48)(0.25) + (0.35)(0.15) + (0.65)(0.2) + (0.74)(0.3) = 0.7135 \\
\mathrm{NA4} &= u(c1)\cdot w1 + u(c2)\cdot w2 + u(c3)\cdot w3 + u(c4)\cdot w4 + u(c5)\cdot w5 \\
&= (0.74)(0.1) + (0.74)(0.25) + (0.35)(0.15) + (0.65)(0.2) + (0.74)(0.3) = 0.6635 \\
\mathrm{NA5} &= u(c1)\cdot w1 + u(c2)\cdot w2 + u(c3)\cdot w3 + u(c4)\cdot w4 + u(c5)\cdot w5 \\
&= (1)(0.1) + (1)(0.25) + (1)(0.15) + (1)(0.2) + (1)(0.3) = 1
\end{aligned}$$

Table 7: Mark End

No	Name Employee	Mark End
1	Responden 1	0.386
2	Responden 2	0.5295
3	Responden 3	0.7135
4	Responden 4	0.6635
5	Responden 5	1
6	Responden 6	0.408
7	Responden 7	0.2455
8	Responden 8	0.6695
9	Responden 9	0.423
10	Responden 10	0.265
11	Responden 11	0.386
12	Responden 12	0.537

No	Name Employee	Mark End
13	Responden 13	0.6135
14	Responden 14	0.363
15	Responden 15	0.1005
16	Responden 16	0.432
17	Responden 17	0.4885
18	Responden 18	0.7135
19	Responden 19	0.025
20	Responden 20	0.0775

3.8 Ranking

After getting the results from the calculations in table 7., create a range. ranking from the order of the highest value largest to smallest value

Table 8: Range Evaluation

Range	Mark Performance
≤ 0.20	Very Bad
0.21 – 0.40	Bad
0.41 – 0.60	Normal
0.61 – 0.80	Good
0.81 – 1	Very Good

Furthermore results from calculation counted with use range The criteria in table 8. are then sorted from the best performance assessment results as in table 9. below:

Table 9: Mark Performance and Range Criteria

No	Name Employee	Mark End	Range Criteria
1	Responden 1	1	Very Good
2	Responden 2	0.7135	Good
3	Responden 3	0.7135	Good
4	Responden 4	0.6695	Good
5	Responden 5	0.6635	Good
6	Responden 6	0.6135	Good
7	Responden 7	0.537	Normal
8	Responden 8	0.5295	Normal
9	Responden 9	0.4885	Normal
10	Responden 10	0.432	Normal
11	Responden 11	0.423	Normal
12	Responden 12	0.408	Normal
13	Responden 13	0.386	Bad
14	Responden 14	0.386	Bad
15	Responden 15	0.363	Bad
16	Responden 16	0.265	Bad
17	Responden 17	0.2455	Bad
18	Responden 18	0.1005	Very Bad
19	Responden 19	0.0775	Very Bad
20	Responden 20	0.025	Very Bad

Based on table 9., from 20 data samples that have used the SMART method, the results of the employee performance assessment rankings are obtained, starting from those with very good assessments. with a final value of 1 to very bad with a final value of 0.025.

4. CONCLUSION

Through implementation Work practice this, it is hoped student get experience directly in the world of work that can expand outlook as well as hone skills think critical and analytical. Work practice give chance for student For develop yourself, enrich your ideas, and apply them knowledge that has been obtained on the bench studying to in situation real in the field. In addition, the activities this also aims For foster a sense of discipline and responsibility answer student to every the assigned task. With feel direct atmosphere and challenges in the environment work, students expected can more understand importance professionalism and commitment in operate roles and responsibilities answer they.

In research this, used SMART (Simple Multi Attribute Rating Technique) method as tool help taking decision For evaluate performance employees. The SMART method is one of the approach taking decisions of a nature multi-attribute, where the technique This used For help stakeholders interest in determine choice best among a number of available alternatives based on a number of criteria that have been determined. Based on results analysis as stated in Table 9., from 20 samples of employee data that were assessed use SMART method, obtained results ranking mark varying endings. Highest value show excellent performance with score end of 1, while mark lowest of 0.025 indicates very poor performance. Range mark This describe to what extent the criteria evaluation fulfilled by each employee, as well as help management in take more decisions objective and measurable in management source Power man.

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