Decision Support System For Example Employee Selection Ministry Of Religion Of Deli Serdang Regency With Analytic Hierarchy Process Method

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Abstract

The absence of selection of exemplary employees at the Ministry of Religion of Deli Serdang Regency has caused the performance and performance of employees to decline Decision support systems are interactive information systems that provide information, model and manipulate data. The decision support system for selecting exemplary employees is not used as a substitute for decisions, but as a support for decision making. The criteria set by the company in applying for credit are discipline, work performance, commitment, responsibility and quality of performance. With the AHP method, from the criteria determined the intensity of importance/priority scale on the criteria. After performing the calculation process, the decision to select exemplary employees was obtained from the ranking of the AHP method: 0.2669947 (rank 1), 0.25695721 (rank 2), 0.2446883 (rank 3), 0.229045 (rank 4). Keywords: motorcycle loan, SPK, AHP method

Keywords*: exemplary employee, DSS, AHP method*

1. Introduction

Currently information technology is growing rapidly, it is used by agencies and companies in an effort to make the agency or company they manage better, so that the agency or company is ready to face competition in the increasingly fierce world of work. In facing this competition, employees who have good work behavior are needed. In an effort to improve employee performance, it is necessary to provide motivation or encouragement so that every employee can work well. For this reason, researchers took the opportunity to create a decision support system for selecting exemplary employees at the Ministry of Religion of Deli Serdang Regency. Decision support systems are interactive information systems that provide information, model and manipulate data. The decision support system for selecting exemplary employees is not used as a substitute for decisions, but as a support for decision making. The decision support system is expected to be able to assist the leadership of the Ministry of Religion of Deli Serdang Regency in making the right decisions to choose exemplary employees. The selection is adjusted to four criteria, namely the presence of employees, status, years of service and responsibilities. In the Decision Support System (DSS) many methods are used, one of which is the Analytical Hiararchy Process (AHP) method. The selection is adjusted to four criteria, namely the presence of employees, status, years of service and responsibilities. In the Decision Support System (DSS) many methods are used, one of which is the Analytical Hiararchy Process (AHP) method. The selection is adjusted to four criteria, namely the presence of employees, status, years of service and responsibilities. In the Decision Support System (DSS) many methods are used, one of which is the Analytical Hiararchy Process (AHP) method.

The system is a collection of interrelated elements that are responsible for processing input (input to produce output). compiled and integrated with a common goal to achieve

certain goals.The system can be interpreted as a systems approach, consisting of a system that emphasizes on procedures and systems that emphasize its elements.

2. Method

AHP is a general theory of measurement. It is used to obtain the relative priority on an absolute scale (invariant under identity transformation) of both pairwise and continuous comparisons in a nested hierarchical structure. This comparison may be taken from actual measurements or from a fundamental scale that reflects the relative strength of preferences and feelings. AHP has particular concern with departures from the consistency and measurement of these departures, and with dependencies within and between groups of structural elements. It has found its widest application in multi-criteria decision making (saaty and Elexander 1989) in resource planning and allocation (saaty 2005), and in conflict resolution. In its general form, AHP is a nonlinear framework for doing both deductive and inductive reasoning without using a syllogism. This possible by taking several factors into account simultaneously, allowing for dependencies and for feedback, and making numerical sacrifices to arrive at a synthesis or conclusion (Asthma Th. Ibraheem & Noor S. Atia, 2016).

2.1 Analysis

In this stage, data analysis and system requirements are carried out. At this stage, a decision support system application design for the selection of exemplary employees will also be carried out using the Analytical Hierarchy Process (AHP) method. AHP method is used in data processing. The initial stage is to determine alternatives and criteria to be selected as employees at the Ministry of Religion of Deli Serdang Regency.

2.1 Analysis Method

The analysis of the system method that will be built in this research is using the AHP (Analytical Hierarchy Process) method. The following is the flowchart used:

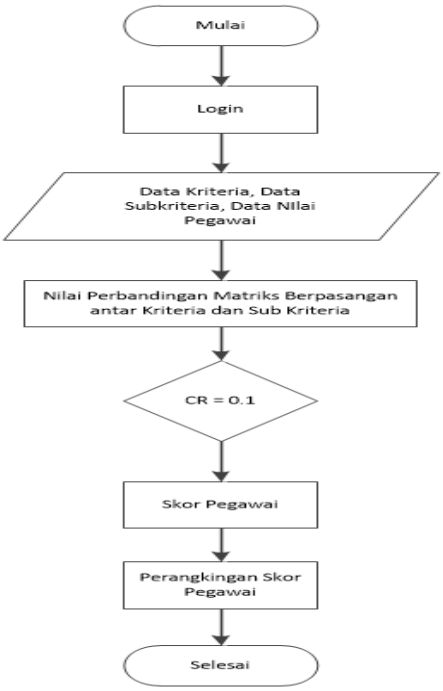

Figure 1. Flowchart of the Exemplary Employee Program

the criteria needed for decision making, based on the provisions set by the Ministry of Religion of Deli Serdang Regency, there are several criteria set, namely: discipline, work performance, commitment, responsibility and quality of performance, then a criterion importance level is made based on the intensity of interest in each criterion, namely as follows:

Table 1.
Intensity of Interest/Priority Scale on Criteria

No	Kriteria	Intensitas Kepentingan	Keterangan	Perbandingan Kriteria
1	Kedisiplinan	1	Kedua Elemen sama penting	Kedisiplinan sama penting
2	Prestasi Kerja	3	Kedua Elemen mempunya nilai berdekatan	Prestasi kerja sedikit lebih penting dari kedisiplinan, prestasi kerja, tanggung jawab dan kualitas kinerja
3	Komitmen	3	Kedua Elemen mempunya nilai berdekatan	Komitmen sedikit lebih penting dari kedisiplinan, prestasi kerja, tanggung jawab dan kualitas kinerja
4	Tanggung Jawab	5	Elemen yang satu sedikit lebih penting, dari pada elemen yang lainnya.	Tanggung jawab, kualitas kinerja lebih penting dari pada yang lainnya
5	Kualitas Kinerja	5	Kedua Elemen yang lebih penting dari pada elemen yang lainnya	Kualitas kinerja, tanggung jawab, kualitas kinerja lebih penting dari pada yang lainnya

The steps in the Analytical Hierarchy Process Method are as follows:

1. Defining the problem and determining the desired solution, then compiling a hierarchy of the problems encountered. The arrangement of the hierarchy is to set goals that are the goals of the overall system at the top level.
2. Determine Element Priority.
    1. 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.
    2. The pairwise comparison matrix is filled in using numbers to represent the relative importance of an element to other elements.
    3. Synthesis

    The considerations for comparison are synthesized to obtain the overall priority. The things that are done in this step are:
        1. Sum the values of each column in the matrix
        2. Divide each value from the column by the corresponding column total to obtain the normalized matrix
        3. Add up the values of each row and divide by the number of elements to get the average value.
3. 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. The things to do in this step are:

1. 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.
2. Sum each row
3. The result of the row sum is divided by the corresponding relative priority element
4. .Sum the above quotient by the number of elements present, the result is called max

4. Calculate the Consistency Index (CI) with the formula:
   CI = (λ max-n)/n
   Where n = number of elements.
5. Calculate consistency ratioRatio (CR) with the formula:
   CR = CI/CR
   Where :
   CR = Consistency Ratio
   CI = Consistency Index
   IR = Random Consistency Index
6. Checking Hierarchy Consistency.
   The list of Random Consistency Index (IR) can be seen in table 3.2

3. Results and Discussion

After compiling the hierarchy above, the next step is to make pairwise comparisons and fill in the pairwise comparison matrix. The data matrix is as shown in the table below:

Table 2.
Criteria Comparison Matrix

	K1	K2	K3	K4	K5
K1	1/1	1/3	1/3	1/5	1/5
K2	3/1	3/3	3/3	3/5	3/5
K3	3/1	3/3	3/3	3/5	3/5
K4	5/1	5/3	5/3	5/5	5/5
K5	5/1	5/3	5/3	5/5	5/5

After the matrix element values are known, the next step is to add up the element values of each column of the criteria comparison matrix as shown in the table below:

Table 3.
Addition of Element Values for each column of the matrix

	K1	K2	K3	K4	K5
K1	1	0.333333333	0.333333333	0.2	0.2
K2	3	1	1	0.6	0.2
K3	3	1	1	0.6	0.6
K4	5	5	1.666666667	1	1
K5	5	5	1.666666667	1	1
Jumlah	**17**	**5.666666667**	**5.666666667**	**3.4**	**3.4**

Divide the value of each comparison matrix element by the corresponding number of columns as shown in the table below:

Table 4.
Criteria Priority Weight Matrix

	K1	K2	K3	K4	K5
K1	1/17	0.333333333/5.666666667	0.333333333/5.666666667	0.2/3.4	0.2/3.4
K2	3/15	1/5.666666667	1/5.666666667	0.6/34	0.2/3.4
K3	3/15	1/5.666666667	1/5.666666667	0.6/3.4	0.6/3.4
K4	5/15	5/5.666666667	1.666666667/5	1/3.4	1/3.4
K5	5/15	5/5.666666667	1.666666667/5.666666667	1/3.4	1/3.4

After the results of the division are obtained, then add up the values of the elements of the priority weight matrix of the criteria as shown in the table below:

Table 5.
the sum of the element values of each row of the criterion priority weight matrix

	K1	K2	K3	K4	K5
K1	0.058823529	0.058823529	0.058823529	0.058823529	0.058824
K2	0.176470588	0.176470588	0.176470588	0.176470588	0.176471
K3	0.176470588	0.176470588	0.176470588	0.176470588	0.176471
K4	0.294117647	0.294117647	0.294117647	0.294117647	0.294118
K5	0.294117647	0.294117647	0.294117647	0.294117647	0.294118

After that, the results of the sum are divided by the number of criteria so that the priority weights are found as shown in the table below:

Table 6
Division of the Number of Element Values

	K1	K2	K3	K4	K5
K1	0.058823529	0.058823529	0.058823529	0.058823529	0.058824
K2	0.176470588	0.176470588	0.176470588	0.176470588	0.176471
K3	0.176470588	0.176470588	0.176470588	0.176470588	0.176471
K4	0.294117647	0.294117647	0.294117647	0.294117647	0.294118
K5	0.294117647	0.294117647	0.294117647	0.294117647	0.294118

Table 7.
Multiplication results Criteria weights and alternatives

	Kedisiplinan	Prestasi Kerja	Komitmen	Tanggung Jawab	Kualitas Kinerja	Nilai Akhir
H.Ahmad, S.Ag	0.294117647	0.882352941	0.882352941	1.470588235	1.470588235	0.244462031
Nurul Ani, SE	0.246153846	0.241935484	0.234375	0.246153846	0.25	0.266468399
Siti Khamsah,SE	0.246153846	0.258064516	0.265625	0.276923077	0.265625	0.229737903
Sri Rosita, S.Ag	0.246153846	0.225806452	0.21875	0.230769231	0.234375	0.259331667

Table 8.
Case Ranking Method Analytical Hierarchy Process

Alternatif	Nilai Akhir	Keterangan
H.Ahmad, S.Ag	0.2446883	Rangking 3
Nurul Ani, SE	0.2666947	Rangking 1
Siti Khamsah,SE	0.229045	Rangking 4
Sri Rosita,S.Ag	0.2595721	Rangking 2

From the results of the AHP calculation, it can be seen that the ranking of exemplary employees is in the order of Code: A001 H. Admad,SAg AHP value: 0.246883 Description of rank 3, A002 H. Nurul Ani,SE AHP value: 0.24666947 Description of rank 1 A003 Siti Khamsah,SE AHP value: 0.229045 Description of rank 4 A004 Sri Rosita AHP value: 0.295721 Description of rank 2.

4. Conclusion

Based on Making a Decision Support System for the Selection of Exemplary Employees at the Ministry of Religion of Deli Serdang Regency is can be concluded :

1. The application of the AHP method in the Decision Support System for Selection of Exemplary Employees at the Ministry of Religion of Deli Serdang Regency through several data transformation processes starting from determining the priority scale of each criterion, assessing the value of each employee to getting the final score and ranking in the process of calculating the AHP method.
2. Of the 4 employees studied with AHP calculations, the order of ranking A01, A02, A03 and A04 obtained 1 exemplary employee Code A02 with a final score of 0.24666947

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