Decision Support System For Employee Performance Assessment Using Smart Method at The Public Housing Service And Settlement Area of Musi Rawas Regency

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Abstract

This study found that a decision support system to evaluate the performance of personnel in public housing services and district housing zones has not been established. Rawas composed the music. Observation and direct recording at the research site (observation), interviews with resource persons (interviews), and documentation by reading existing books and literature (documentation) are some of the ways this research collects data (documentation research). Based on research conducted at the Department of Public Housing and residential areas in Musi Rawas Regency, the author makes a decision support system application that helps the community in evaluating their work. There may be a decision support system for assessing employee performance based on a discussion of the analysis that has been carried out. This system can be used to evaluate employee performance using the SMART method as a method of decision making. With this system made, it can help the assessment team determine which employees deserve to be the best employees according to the criteria applied.

Keywords : SPK , SMART.

1. Introduction

The performance appraisal of employees at the Public Housing Service has been carried out every year, the Head of the Service has distributed circulars to all employees of the Public Housing Service and Kab. Musi Rawas in the neighborhood. The selection team has collected requirements to be researched and corrected in order to evaluate employee performance, then the names are brought together by the assessment team, then the results of the meeting are used as a sequence in the assessment of the best prospective employees, in this process there is often subjectivity from decision makers.

According to Turban (1995). decision support system (DSS) is applied by Mulyanto (2009). Decision Support Systems (DSS) combine data and knowledge to increase the effectiveness and efficiency of decision making. This system is called DSS. As decision support systems (DSS) become more common, the use of data from decision models to solve structured and unstructured problems is becoming increasingly important over time. [2].

To overcome this problem, it is necessary to build a decision support system for evaluating employee performance based on agreed criteria. One mechanism that can be used to assist in decision making is to use a decision support system using the *Simple Multi Attribute Rating Technique (SMART) method.*

1.1 Objectives
The objectives to be achieved from this research are as follows:
1. To determine employee performance appraisal criteria.
2. Build a system that can facilitate the Department of Public Housing and Residential Areas of the Regency. Musi Rawas in making decisions so that it can be accepted by all parties.

2. Literature Review

Performance appraisal or Performance Appraisal (PA) is a formal system used for a certain period of time to assess the work performance of an employee. In addition, performance appraisal can function to identify, observe, measure, record, and see the strengths and weaknesses of employees in doing work. The use of this performance appraisal can improve the work performance of employees. Performance appraisal is really designed in such a way to help companies achieve organizational goals and motivate employee performance.

Employees are a supporting factor in a company or agency, because with employees who have company qualification standards, the company's productivity will definitely be maintained and increase.

Decision Support System is an information system for managing complex and semi-structured and unstructured decision making. The system is an interactive computer-based system which is intended to assist in making decision problems by utilizing certain data and models to solve unstructured problems.

In Simorangkir (2016) Novianti explains SMART (Simple Multi Attribute Rating Technique) 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 a number of criteria that have values. and each criterion has a weight that describes how important it is compared to other criteria. This weighting is used to assess each alternative in order to obtain the best alternative.

3. Methods
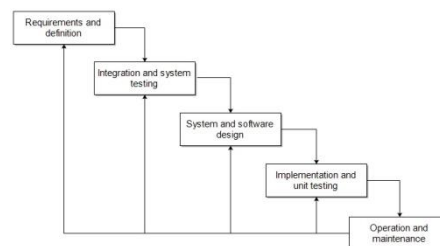
Picture 1. Waterfall Method

The Waterfall method is a software development method in which progress is seen as moving downwards (like water moving down a waterfall) through the planning, modeling, development, and testing stages. The Waterfall development method has several stages, including:
1. Requirements and Definitions
    People who use service systems talk to each other about their needs and wants, and those needs and wants are then detailed and converted into system specifications which are then put into practice.
2. System and Software Design
    At the beginning of the system design process, the overall system architecture is set. During this step, the system hardware and software requirements are assigned to the hardware and software components. It is very important to understand and abstract the underlying structure of how software works so that you can make it easier to create new software.
3. Implementation and Unit Testing
    At this stage, software design is carried out when many programs or program units are created. Testing is the process of ensuring that each product meets specifications.
4. Integration and System Testing

To evaluate whether individual parts of a program or programs conform to the requirements of the software, they must be assembled and tested as a whole system. The software can be delivered to the customer when it has been tested.

5. Operation and Maintenance

On average, this is the most time-consuming step (though not always). The system has been built and is now working. Maintenance is the process of finding and fixing problems not found in the previous stage, improving the way system units work, and improving system services when new requirements are discovered and implemented..

4. Data Collection

Collecting data directly from the object under study. The methods used to collect data are as follows:

1. Observation method

Observation is direct observation, which is an activity whose purpose is to obtain information needed in conducting observations as well as recording and direct observation to the Public Housing Service and the settlement area of Musi Rawas Regency.

2. Interview method

Interview is data collection by conducting direct question and answer. before making it first then submitted to the respondent to be able to provide the information needed by the researcher.

3. Documentation

Documentation is the collection of data such as documents needed for research.

4. Literature study

The author collected literature studies by reading books at the Bina Insan University library and other sources such as journals and internet sites related to research.

5. Results and Discussion

5.1 Numerical Results

SMART technique is used to evaluate employee performance in a decision support system. The following are the steps that must be taken during the settlement process using the SMART technique:

1. Determine the criteria, weights and normalization of the weights of the criteria used.

Criteria	Description	Weight	Normalization (Wj)
K1	Job performance	40	40/100 = 0.4
K2	Discipline	20	20/100 = 0.2
K3	Presence	20	20/100 = 0.2
K4	Cooperation	20	20/100 = 0.2
Sum		100	

Table 1. Criteria

2. Gives the value of each alternative.

Code	Alternative Name	Criteria			
		K1	K2	K3	K4
A1	Siti Mufliha	50	30	50	20
A2	Agus Rianto	30	50	20	20
A3	Harnanto	50	30	30	30
A4	Sulastri	30	30	30	20

Table 2. Alternative value

3. Calculating the Utility value of each criterion.
   To calculate the Utility value using the formula:

$$ui(ai) = 100\frac{C - C\ outi}{C\ max - C\ min}\%$$

a. Utility value of A1

No	Criteria	Alternative value	ui(ai)
1	Job performance (K1)	50	$= 100\frac{100-50}{100-0} = 50$
2	Discipline (K2)	30	$= 100\frac{100-30}{100-0} = 70$
3	Presence (K3)	50	$= 100\frac{100-50}{100-0} = 50$
4	Cooperation (K4)	20	$= 100\frac{100-20}{100-0} = 80$

Table 3. Calculating table value of A1

b. Utility value of A2

No	Criteria	Alternative value	ui(ai)
1	Job performance (K1)	30	$= 100\frac{100-70}{100-0} = 70$
2	Discipline (K2)	50	$= 100\frac{100-50}{100-0} = 50$
3	Presence (K3)	20	$= 100\frac{100-20}{100-0} = 80$
4	Cooperation (K4)	20	$= 100\frac{100-20}{100-0} = 80$

Table 4. Calculating table value of A2

c. Utility value of A3

No	Criteria	Nilai Alternatif	ui(ai)
1	Job performance (K1)	50	$= 100\frac{100-50}{100-0} = 50$
2	Discipline (K2)	30	$= 100\frac{100-30}{100-0} = 70$
3	Presence (K3)	30	$= 100\frac{100-30}{100-0} = 70$
4	Cooperation (K4)	30	$= 100\frac{100-30}{100-0} = 70$

Table 5. Calculating table value of A3

d. Utility value of A4

No	Criteria	Alternative value	ui(ai)
1	Job performance (K1)	30	$= 100\frac{100-30}{100-0} = 70$
2	Discipline (K2)	30	$= 100\frac{100-30}{100-0} = 70$
3	Presence (K3)	30	$= 100\frac{100-30}{100-0} = 70$
4	Cooperation (K4)	20	$= 100\frac{100-20}{100-0} = 80$

Table 6. Calculating table value of A4

4. Calculate the final value and do the ranking.

To calculate the overall value of Utility with the formula:

$$u(ai) = \sum_{j=i}^{m} wj.ui(ai)$$

a. Overall Utility value of A1

No	Criteria	ui(ai)	Wj	u(ai)
1	Job performance (K1)	50	0.4	20
2	Discipline (K2)	70	0.2	14
3	Presence (K3)	50	0.2	10
4	Cooperation (K4)	80	0.2	16
	Sum			60

Table 7. Calculating table Overall score A1

b. Overall Utility value of A2

No	Criteria	ui(ai)	Wj	u(ai)
1	Job performance (K1)	70	0.4	28
2	Discipline (K2)	50	0.2	10
3	Presence (K3)	80	0.2	16
4	Cooperation (K4)	80	0.2	16
	Sum			70

Table 8. Calculating table Overall score A2

c. Overall Utility value of A3

No	Criteria	ui(ai)	Wj	u(ai)
1	Job performance (K1)	50	0.4	20

2	Discipline (K2)	70	0.2	14
3	Presence (K3)	70	0.2	14
4	Cooperation (K4)	70	0.2	14
Sum				62

Table 9. Calculating table Overall score A3

d.   Overall Utility value of A4

No	Criteria	ui(ai)	Wj	u(ai)
1	Job performance (K1)	70	0.4	28
2	Discipline (K2)	70	0.2	14
3	Presence (K3)	70	0.2	14
4	Cooperation (K4)	80	0.2	16
Sum				72

Table 10. Calculating table Overall score A4

Thus the highest alternative value is **Sulastri** with a sum of 72..

5.2 Graphical Results

1.   Login page view

The system start page, which displays the login menu, will appear when the user has reached the first access to the system. The system start page is shown in Picture 2.
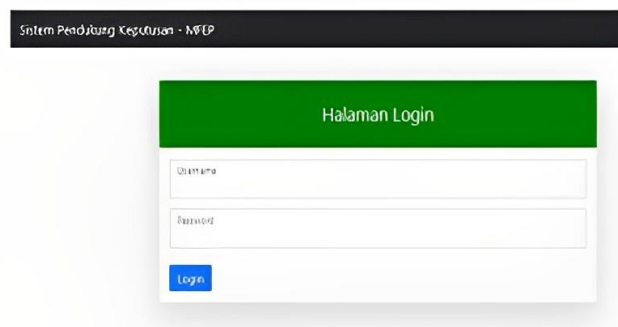
Picture 2. Login page view

2.   The main system admin page display

The main system page will be presented to the user when he has successfully logged into the system. The main graphic of the program serves as the background, as shown in Picture 3.

Picture 3. Display of the main system admin page

3. Display employee data

    page The employee data page will appear after the user selects the employee data menu. The employee data page can be seen in Picture 4 and 5.

Picture 4. Display the employee data input page

Picture 5. Display of employee data page

4. Criteria data page display The criteria

   data page appears after the admin selects the criteria data option. The images of the criteria data page can be seen in Picture 6 and 7.

Picture 6. The appearance of the criteria data input page

Picture 7. Criteria data page display

5. Rating data page view The assessment data
   page will appear when the administrator has selected the assessment data option. The assessment data page is shown in Picture 8 and 9.
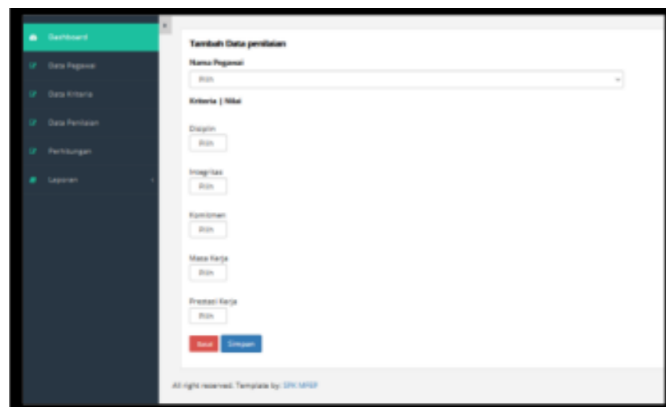
Picture 8. Display of the assessment data form page
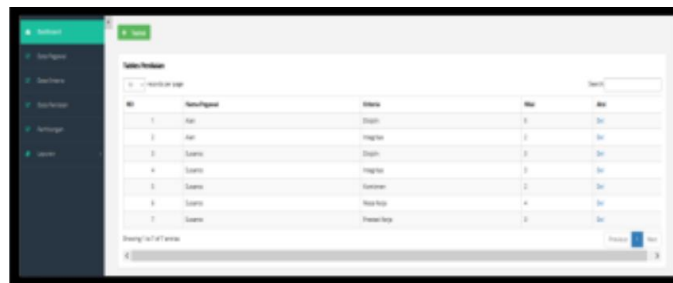
Picture 9. Display of the assessment data page

6. Display of calculation data page
   The calculation data page will appear when the administrator has selected the calculation data option. The calculation data page is in Picture 10.

Picture 10 . Calculation data page display

7. Report data results

The report page will appear when the administrator has selected the report data option.

Picture 11. Display of the result data report

5.3 Validation

Testing is an important part of the software development process, testing is carried out to ensure the software, testing is carried out to ensure the software is good and find problems. These tests are carried out to ensure that the employee performance evaluation decision support system made is of high quality. The software is tested using the Black Box method.

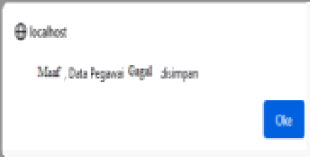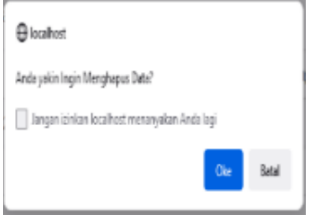| Requirements	Test Scenario	Expected	Test Result	KET
Login System	System Login (if correct)	Go to main page System		*Valid*
	Login System (if false)	Message "Login confirmation failed" appears and system login display Returns		*Valid*
Input employee	Input employee data (if successful)	data is stored in the database and returns to the home page.		*Valid*
	Employee data input (if it fails)	data is not saved and a description of failed input appears		*Valid*

	Edit Employee data (if successful)	The employee information database is updated, and the page is redirected to the home page..		*Valid*
Edit Employee	Edit Employee data (if not successful)	Employee data in the database is not edited and displays Edit failed.		*Valid*
Delete Employee	Delete Employee data (if successful)	The employee data in the Deleted database is selected, and a pop-up window opens indicating that the data has been successfully deleted. The user is then redirected to the main page		*Valid*
	Delete employee data (if unsuccessful)	employee data in the database is not deleted, and a popup window appears stating that the data cannot be deleted.		*Valid*

Table 11. System test table

A decision support system for assessing employee performance is functioning as expected in terms of functionality. In accordance with the results of tests carried out using the sample test cases described above.

6. Conclusion

Discussion of the analysis that has been carried out, it can be concluded as follows: The components of the decision support system for evaluating employee performance with the SMART technique are as follows: With this system, it can help the assessment team determine which employees deserve to be the best employees according to the established criteria.

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