Implementation Of Technique For Order Preference By Similarity To Ideal Solution Method In Performance Assessment Of Best Medical Personnel In Public Hospitals Kepahiang Area

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Abstract: *In assessing the performance of the best medical personnel at the Kepahiang Regional General Hospital, there are several criteria that are used as an assessment. This assessment is based on the assessment of the performance of medical personnel, namely Service Orientation, Responsibility, Discipline, and Attendance. In this study, the technique for order preference by similarity to ideal solution (TOPSIS) method is applied with a decision support system, each of the criteria in the assessment of the performance of medical personnel is compared with one another, thus providing an output of priority intensity values for each medical personnel. From the description above, it can be concluded that in assessing the performance of the best medical personnel, only those who meet the criteria with the highest value will be selected.*

Keywords: *SPK,Medical Personnel Performance Appraisal, Topsis Method*

Introduction

Information technology has become an important part of various fields of life. Information is needed in the decision-making process. Good and appropriate decisions need to be supported by the availability of accurate, fast, and sufficient information. With such information, the leadership of an institution or organization can get a complex and specific picture of a decision to be formulated (Darsaut et al., 2023).

The performance of medical personnel is work performance, namely the comparison between the results of work that can be seen in real terms with the work standards set by the organization (Oliveira et al., 2023).Quality performance will be realized if an organization can choose the best medical personnel candidates who have the motivation in accordance with their work and have the quality that allows them to work optimally (Gordon et al., 2020).

Hospitals are an integral part of the overall health service system that serves patients with various types of services. Health has a big role in improving the degree of community life, in providing optimal health services in hospitals, quality resources are

needed, by using existing resources it is hoped that the hospital can produce a maximum output in the form of products or services to improve services (Sahu et al., 2019).

Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) is a method to assist decision making where alternatives are selected based on certain criteria. From the description above, the authors are interested in conducting research with the title "Implementation of the Technique for Order Preference by Similarity to Ideal Solution Method in Performance Assessment of the Best Medical Personnel of the Kepahiang Regional General Hospital" (Zhu & Wu, 2023).

Theoretical Foundation

Implementation

In general, implementation in the large Indonesian dictionary means implementation or application. The term implementation is usually associated with an activity that is carried out to achieve certain goals. Implementation is a placement of ideas, concepts, policies, or innovations in a practical action so that it has an impact, both in the form of changes in knowledge, skills and values and attitudes (Haji, 2020) (Sam et al., 2019). Implementation is a process of implementing or applying ideas, concepts, policies, or innovations in a practical action so that it has an impact, both in the form of changes in knowledge, skills and values and attitudes (Winkler-Schwartz et al., 2019).

Topsis Method

According to Dedek Indra, et al (2023: 78) Decision problems are not only caused by uncertainty or imperfect information, the diverse selection criteria and also the weight value of each criterion are a form of very complex decision problems, in this day and age multicriteria problem solving methods have been widely used in various fields. One method that can be used to solve multicriteria problems is the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method (Zhang et al., 2024).

Calculation Stages Of Topsis Method

In general, the calculation stages of the topsis method are as follows:

1. Determine the criteria to be used.
2. Determine the sample data to be used.
3. Determine the normalized decision matrix

    $Xij\ Rij = \sqrt{\sum 2\ m\ i{=}1\ x\ ij}$ ....(1)

    Description :

    Rij: the result of matrix normalization.

    Xij : decision matrix element.

    i : alternative where i = 1, 2, ..., m.

    j : criteria where j = 1, 2, ..., n.
4. Determine the normalized weight of the decision matrix.

    $Yij = Wi.Rij$...(2)

    Description:

    Yij : calculation result

    Wi : criterion weight

Rij : normalized decision matrix element

with i = 1, 2,. . . , m; and j = 1, 2, . . . , n.

with provisions:

A + = (y1 + , y2 + , ... yn +);

A - = (y1 - , y2 - , ... yn -);

 Where:

Yi+ = { $maxyij$ (*Jika j adalah atribut keuntungan*) $Minyij$ (*jika j adalah atribut biaya*) }

Yi = - { max ⬜ yij (*Jika j adalah atribut keuntungan*) $Minyij$ (*jika j adalah atribut biaya i*) }

With a value of j = 1,2....n8

5. Find the distance between alternative Ai and the positive ideal solution with the formula:

   At = + $\sqrt{\sum}$ ($yi+$ ⬜ − yij) 2 ⬜ $n\,j$ ....(3)

   Description: i =1,2,...m

6. Determine the distance between alternative Ai and the negative ideal solution with the formula:

   At = - $\sqrt{\sum}$ (yij − yi− ⬜ $n\,j$) 2 ⬜ ....(4)

   Description: i = 1,2,...m

7. Calculate the preference and ranking value of each alternative with the formula:

   Vi = Di− ⬜ Di − +D + i ⬜ ; i=1,2,...m...........................(5)

   Description:

   The largest Vi value indicates that alternative Ai is preferred to be the solution.

8. Perform ranking.

Performance Assessment

According to Rismawati (2019: 2) performance is a condition that must be known and confirmed to certain parties to determine the level of achievement of the results of an agency in relation to the vision carried out by a company or company that knows the positive and negative impacts of an operational policy (Galyfos et al., 2019).

Medical Staff

Article 11 paragraph (2) of Law Number 36 of 2014 explains "the types of health workers included in the group of medical personnel as referred to in paragraph (1) letter a consist of doctors, dentists, specialist doctors, and specialist dentists" (Hill et al., 2021).

Methodology

In conducting this research the author uses a system development method. Where the method developed by the author is the Waterffal method, the method used by the author is shown in Figure 3.1 below:
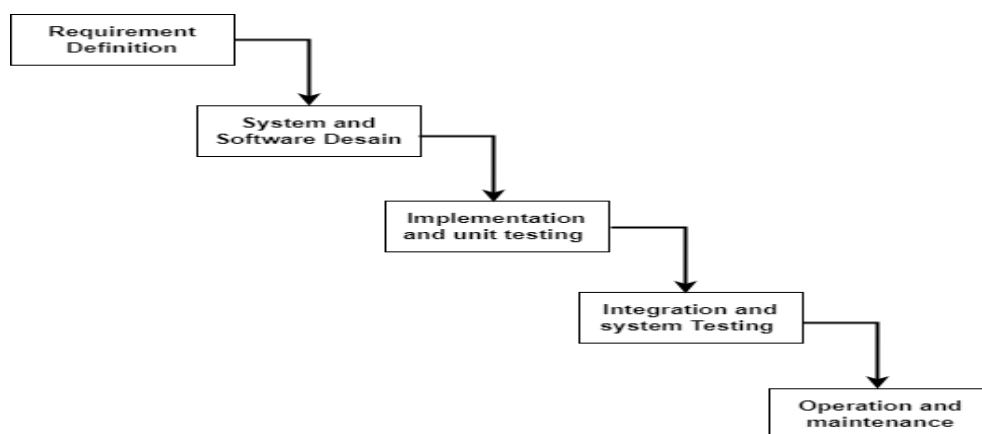
Figure 1. Waterfall Method

a) Requirements and definition

In this stage, the author analyzes the system needs through observation, interviews, and literature studies. After that, from the results of the analysis will appear an assessment data needed in making this application.

b) system and software design

In this stage, the author designs an application by looking at the results of the data that has been done in the previous stage.

c) Implementation and unit testing

In this stage, the author designs the system that has been developed to the research site to conduct several trials of the application.

d) Integration and system testing

In this stage, integration (updating) of the application to the research site is carried out then testing the system.

e) Operation and maintenance

In this stage, the process of operating the application is carried out and at the same time maintaining the system so that it can work as much as possible.

Result and Discussion

The implementation of the technique for order preference by similarity to ideal solution method in assessing the performance of the best medical personnel of the Kepahiang Regional General Hospital will be made using the Visual Basic Net programming language using the Microsoft Access database as a tool in storing the results of data processing. Where the results and discussion this time there are several menus including the login menu, data input, topsis method, and output, as well as the exit button on the main menu there is a system that can connect to other menus (Huppert et al., 2021).

1. Login Menu Display

The login menu display in the performance assessment of the best medical personnel at the Kepahiang Regional General Hospital, where the admin must first enter the correct

username and password, to proceed to the main menu. The login menu display can be seen in Figure 4.1 below:
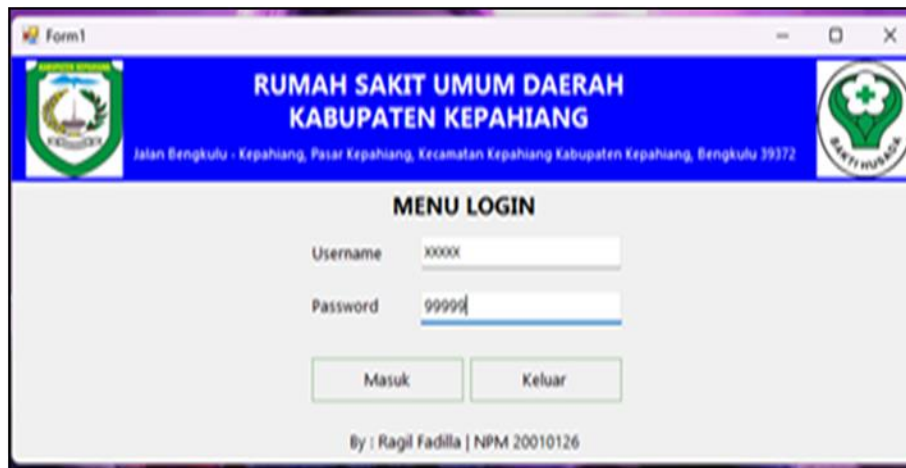
Figure 2. Login Menu Display

2. Main Menu Display

In the main menu display contained in the implementation of the technique for order preference by similarity to ideal solution method in assessing the performance of the best medical personnel at the Kepahiang Regional General Hospital, there are several menus and sub menus, including the main menu, which on the main menu consists of a data input menu, application of the topsis method, as well as data output and exit menu. The main menu display can be seen in Figure 4.2 below (Webb et al., 2022).

Figure 3. Main Menu Display

3. Medical Staff Data Menu Display

In the menu display of medical personnel data on the implementation of the technique for order preference by similarity to ideal solution method in assessing the performance of the best medical personnel at the Kepahiang Regional General Hospital consists of several menus including nik, name, medical personnel, section, position, gender, religion, address, cellphone number. The menu display on medical personnel data can be seen in Figure 4.3 below (Weissman et al., 2023).

Figure 4. Display of Medical Personnel Data Menu

4. Criteria Data Menu Display

The display of the criteria data menu on the implementation of the technique for order preference by similarity to ideal solution method in assessing the performance of the best medical personnel at the Kepahiang Regional General Hospital consists of criteria codes, criteria names, and weights. The display of the criteria data menu is shown in Figure 4.4 below (Chen et al., 2022) :

Figure 5. Criteria Data Menu Display

5. Subcriteria Data Menu Display

The subcriteria data menu display on the implementation of the technique for order preference by similarity to ideal solution method in assessing the performance of the best medical personnel at the Kepahiang Regional General Hospital consists of criteria code, subcriteria code, subcriteria name and weight. The display of the sub-criteria data menu is shown in Figure 4.5 below (Familoni & Babatunde, 2024).

Figure 6. Subcriteria Data Menu Display

6. Assessment data menu display

The appearance of the assessment data menu in the performance assessment of the best medical personnel at the Kepahiang Regional General Hospital consists of several menus including nik, year of assessment, name of medical personnel, criteria 1, criteria 2, criteria 3, criteria 4. The appearance of the assessment data menu can be seen in Figure 4.6 below.

Figure 7 . Display of Assessment Data Menu

7. Menu Display Data Application of Topsis Method

In the menu display of the application of the topsis method in assessing the performance of the best medical personnel at the Kepahiang Regional General Hospital, it consists of several menus, namely those consisting of the assessment year, and the process button serves to see the results of the normalized value. The display of the topsis method analysis menu can be seen in Figure 4.7 below :

Figure 8. Menu Display of Data Application of Topsis Method

8. Display of Output Report of Best Medical Personnel Performance Assessment Results

The report output display on the application of the topsis method in assessing the performance of the best medical personnel at the Kepahiang Regional General Hospital consists of No, assessment code, name of medical personnel, ranking and value v. The report menu for the results of selecting the best medical personnel performance is shown in Figure 4.8 below :
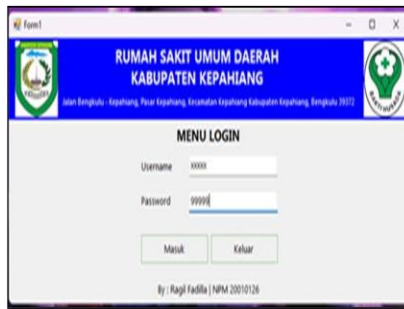

Figure 9. Display of Output Report of Best Medical Personnel Performance Assessment Results

System Testing Results

System testing using the black box method is a test based on checking the design details that use the control structure of the program design procedurally to divide the test into

several test cases, at a glance. We take some conclusions from black box testing which is a guide in getting the right program according to what we want. The next stage is testing by involving users, namely medical staff at the Kepahiang Regional General Hospital to test this program the author makes several questions to 4 medical personnel who will be involved with the system to be built.

Table 1. Scenario Testing

No	Scenario Testing	Test	Results	Conclusion
1	First the admin enters the correct user name & password		After entering the correct user name and password then enter the main menu	Testing Successful
2	Input medical personnel data		Based on the application made, the medical staff data input button can function properly.	Testing Successful

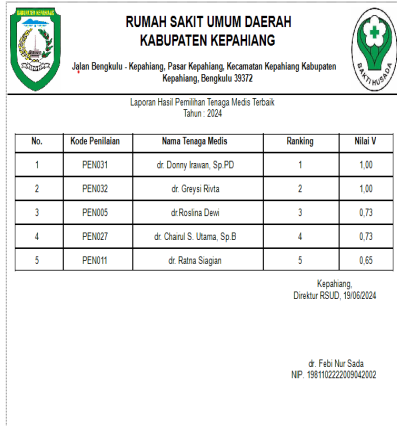| 3	Input criteria data consisting of, Criteria code, criteria name, weight		The application designed on the criteria data input menu functions correctly	Testing Successful
4	Input assessment data, where the assessment data consists of the assessment id. year of assessment name of medical personnel, and criteria.		In accordance with the designed application the assessment input button can function correctly	Testing Successful

| 5 | Outputting a medical staff assessment data report consisting of assessment code number, medical staff name, ranking and score. | | Based on the output of the medical personnel assessment in the designed application, the report output button can function correctly. | Testing Successful |

Table 2. System Testing Results

No	Parts to be Tested	Testing Results		
		Less	Simply	Good
1	Display of the Program/Application designed by the author			√
2	Ease of running the program designed by the author		√	
3	What do you think about the application made by the author			√
4	Then what do you think about the medical personnel performance assessment program / application designed by the author			√

Conclusions

Based on the results and conclusions of the discussion and testing that has been done, it can be concluded as follows :

1. The application of the performance appraisal of the best medical personnel of the Kepahiang Regional General Hospital was made using the topsis method with the Visual Basic Net programming language with an access database as a supporting

medium, storing data processing results that can be used by the hospital in inputting future performance appraisals.

2. In assessing the performance of the best medical personnel of the Kepahiang Regional General Hospital by applying the topsis method, namely by calculating the weight of the criteria by determining the ranking based on the average preference value approach.

3. From all calculations of the performance assessment of the best medical personnel of the Kepahiang Regional General Hospital, which has been determined by the assessment criteria with the topsis method, only the best people will be selected.

4. By using the best medical personnel assessment application, it will help decision making for performance appraisal at the Kepahiang Regional General Hospital. Based on the conclusion, the author suggests :

1. In future research, it is expected to build a more complete system by providing detailed information about performance.

2. It is expected to be developed based on broader interests using other methods and applications

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