The IJICS (International Journal of Informatics and Computer Science)
Vol 5 No 2, July 2021, Page 194-198
ISSN 2548-8384 (online), ISSN 2548-8449 (print)
Available Online at https://ejurnal.stmik-budidarma.ac.id/index.php/ijics/index
DOI 10.30865/ijics.v5i2.3200

Decision Support System for Appointment Assignment of Honorary Using TOPSIS Method

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Submitted: **20/07/2021**; Accepted: **30/07/2021**; Published: **31/07/2021**

Abstract−The Honorary Staff Appointment and Assignment Program initiated by the Education Office of North Gorontalo Regency is one of the regional responses to overcome the shortage of teachers in remote areas and islands [1]. The purpose of this study is to build a decision support systemv that is used to assist the Education Office of North Gorontalo Regency in the process of appointing and assigning honorary staff. This study uses the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method. This method is based on the concept that the best chosen alternative not only has the shortest distance from the positive ideal solution, but also has the longest distance from the negative ideal solution. This method is widely used to complete practical decision making [2]. The results of this study are by using the TOPSIS method in a decision support system that can facilitate decision makers related to the issue of the Handling and Assignment of Honorary Personnel at the Education Office of North Gorontalo Regency, especially in the assessment process according to predetermined criteria. The results of this assessment took a sample of 3 honorary candidates with the best score alterative obtained by a total value of 0.74 with the results being accepted as honorary

Keywords: Honorary Personnel; Decision Support System; TOPSIS Method

1. INTRODUCTION

Regional autonomy, which is the basis for decentralization of education, gives local governments greater authority in planning and budgeting for education in the regions. This includes the authority of the local government to manage educators and education personnel in accordance with the needs and capabilities of the region(D. P. K. G. Utara, 2019). With this authority, local governments can innovate programs to meet the needs of teachers in their regions, especially in remote areas and islands. The Honorary Personnel Appointment and Assignment Program initiated by the Education Office of North Gorontalo Regency is one of the regional responses to overcome the shortage of teachers in remote areas and islands as well as the appointment of honorary staff who have good performance in their fields to assist in the work process of the world of education. This program has several advantages, including that the educators recruited are natives of the region so that they have a higher endurance to work in remote islands and villages, before being rotated to other areas within the district. According to the Data Recap at the North Gorontalo District Office, up to 2016 there were approximately 423 non-permanent honorary teachers assigned to islands and remote areas, while there were around 1,050 non-permanent honorary teachers scattered in the good district level. Right-Right Park up to high school, the temporary teacher placement is based on the needs of the schools according to the field of knowledge of each non-permanent teacher.

Based on the results of observations on the existing system at the education office of North Gorontalo Regency at this time in terms of processing data on the appointment and assignment of honorary staff still using a direct recording and selection system so that this could have an impact on the slow process of providing reports to the relevant management, also hampering decision-making process, the process that runs manually currently still takes a long time. It is relatively difficult to select any temporary non-permanent teacher honorary staff who are entitled to teaching assignments to the designated places, as is the case with the appointment of non-permanent employee honorary staff because they are expected to be able to meet all the assessment criteria in accordance with the required field. To be able to anticipate the things mentioned above, a computerized decision support system is made.

This decision support system helps evaluate each employee, changes the criteria, and changes the weight value. The criteria in question are pedagogic, personality, social and professional criteria. This is useful for facilitating decision makers related to the issue of the Handling and Assignment of Honorary Personnel at the Education Office of North Gorontalo Regency

Decision support systems can provide information that will provide alternative solutions to problems that occur. Decision support systems require methods to find alternative solutions. There are several methods to solve the problem of Assignment and Appointment of Honorary Personnel, among others by using the Simple Additive Weighting (SAW), Analytic Hierarchy Process (AHP), Technique for Order Preference by Similarity to Ideal Solution (TOPSIS). From several possible methods, Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method was chosen. This method is based on the concept that the best chosen alternative not only has the shortest distance from the positive ideal solution, but also has the longest distance from the negative ideal solution [3]. This method is widely used to complete practical decision making.

Related research using the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method has been carried out by previous authors, including research from Amelia Nur Fitriana et al., 2015 [2], entitled "Decision Support System To Determine Student Academic Achievement with the TOPSIS Method" in this study there are still problems in making student learning reports, to determine students who excel only determined using report cards, the absence of optimal utilization of student learning outcomes assessment report data, there are still difficulties to determine

the achievement of student learning activities. By using the TOPSIS method, it is easier for teachers to determine student academic achievement accurately and quickly. From testing 20 alternatives with 6 criteria.

Research conducted by Nuri Guntur Perdana, 2013 [3], entitled "Decision Support System for Giving Scholarships to New Students Using the TOPSIS Method in this study The criteria used in the system vary, according to the scholarships provided by the institution. The applicant's value data that has been entered into the system will be calculated using the TOPSIS method, by finding the furthest and closest distances from the positive and negative ideal solutions. The applicant with the highest v score will be at the top of this system. Based on the results of the selection case examples show that the results of calculations using the system are the same as manual calculations. This system is able to provide recommendations for scholarships.

Research conducted by Kelvin Wijaya et al., 2015 [4] entitled Decision Support System for Scholarship Recipients With the Technique For Order Preference By Similarity to Ideal Solution Method at Sam Ratulangi University Manado "is aimed at producing an objective and systematic Decision Support System in determining recipients scholarships with the best qualifications. The method used as a stage of this research is the Rapid Application Development (RAD) method which is a software design method that emphasizes a short development cycle. The data that is used as a reference for the requirements of the system that is built is obtained from interviews with the head of the student affairs sub-section and alumni of the engineering faculty. Based on the results of function testing, the decision support system for scholarship recipients with the TOPSIS method shows an objective, systematic and flexible process function for each student and scholarship program, so as to provide optimal results in the selection of scholarship recipients.

2. RESEARCH METHODOLOGY

2.1 Framework of Thought

The stages in designing a planning and fulfillment information system are as follows:

a). Determining the object of research, at this stage a review of the system to be studied is carried out to observe and conduct deeper exploration and explore the problems that exist in the current system.

b). Literature study, at this stage aims to find out what method will be used to solve the problems to be studied, as well as obtain strong reference bases for researchers in applying a method they use.

c). Data and information collection. At this stage, data and information were collected to find out more about the system under study. The data and information collected will be known about the current system. Data and information obtained through direct interviews with several employees, techniques and direct observation.

d). Analysis of the current system, this analysis aims to find out the current system, especially the process of appointment and assignment of Honorary Personnel in the education office of North Gorontalo Regency, Analysis of the existing system needs to be done before analyzing problems, system weaknesses and needs -system requirements.

e.) Analysis of system requirements aims to identify what is still lacking from the system, and then take steps to improve and develop a computerized system.

f). Database Design, The database is a collection of data that are interconnected with each other, The database (database) is an important component in information systems. At this stage, a database design will be carried out.

f). Interface design, the interface is a medium that connects the user (user) with the information system. The system to be built is expected to provide an interface that is easily understood by users.

2.2 Decision Support System

Decision Support System (DSS) is an approach or methodology to support decisions. DSS uses a flexible, interactive and adaptable CBIS (Computer Based Information System), which was developed to support solutions to unstructured specific management problems. DSS uses data, provides an easy user interface and can incorporate the thinking of decision makers. In addition, DSS typically use multiple models and are constructed by an interactive and iterative process. It supports all phases of decision making and can include a knowledge component. DSS can be used by a single user on a single PC or can be Web-based for use by many people in several locations [4].

2.1 Honorary Staff

Based on Government Regulation No. 48 of 2005 Jo. Government Regulation Number 43 of 2007 Article 1 concerning the Appointment of Honorary Personnel, explains that honorary staff is someone who is appointed by a staffing officer or other official in the government to carry out certain tasks in government agencies or whose income is the burden of the APBN/APBD. The appointment of honorary staff based on Government Regulation Number 43 of 2007 is intended to meet the needs of certain personnel in government agencies, the appointment of honorary staff is carried out through an examination of administrative completeness.

2.2 Metode Technique For Order Preference by Similarity to Ideal Solution (TOPSIS)

The Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) is based on the concept that the best chosen alternative not only has the shortest distance from the positive ideal solution, but also has the longest distance from the negative ideal solution [5] Steps to solve the MADM problem with TOPSIS:

a. Create a normalized decision matrix.

b. Create a weighted normalized decision matrix.
c. Determine the positive ideal solution matrix & negative ideal solution matrix.
d. Determine the distance between the value of each alternative with a positive ideal solution matrix & a negative ideal solution matrix.
e. Determine the preference value for each alternative.

3. RESULT AND DISCUSSION

3.1 Honorary Personnel Assessment Criteria

Teacher professionalism is the ability of teachers to carry out their main duties as educators and teachers, including the ability to plan, conduct, and carry out learning evaluations. Professional teachers not only master the field of science, teaching materials, master the right method, are able to motivate students, have high skills and broad insight into the world of education [5]. Professional teachers must also have a deep understanding of human nature, and society.
These natures will underlie the mindset and work patterns of teachers and their loyalty to the education profession. Also in the implementation of the teaching and learning process teachers must be able to develop a classroom organizational culture, and a teaching organizational climate that is meaningful, creative and dynamic, passionate, dialogical so that it is fun for students in accordance with the demands of the National Education System Law (UU No 20/2003 Article 40 paragraph 2
a). The criteria for the Assignment and Appointment of Non-Permanent Honorary Teachers at the Education Office of North Gorontalu Regency are as follows:

Tabel 1. Criteria for Appointment and Assignment of Honorary Personnel at the Education Office of North Gorontalo Regency

No.	KRITERIA	Bobot
A.	Pedagogik	35 %
1.	Mastering the Characteristics of Learners	3
2.	Mastering learning theory and educational learning principles.	3
3.	Curriculum Development	3
4	Potential development of students	3
5	Communication with students	3
6	Assessment and Evaluation	3
B	Personality	15 %
7	Act in accordance with religious norms, social laws and national culture.	4
8	Show a mature and exemplary personality	3
9	Work ethic, high responsibility, and a sense of pride in being a teacher.	3
C	Social	20 %
10	Be inclusive, act objectively, and not discriminate.	3
11	Communication with fellow teachers, education staff, parents, students and the community.	3
D.	Professional	30%
12	Mastery of materials, structures, concepts and scientific patterns that support effective subjects.	3
13	Developing Professionalism through reflective action.	3

With the Terms of Value as follows:
Value 4 = Very Good
Value 3 = Good
Value 2 = Enough
Value 1 = Less

3.2 Proses The assessment process uses the TOPSIS method

Figure 2. Desaign Input The Honorary of data

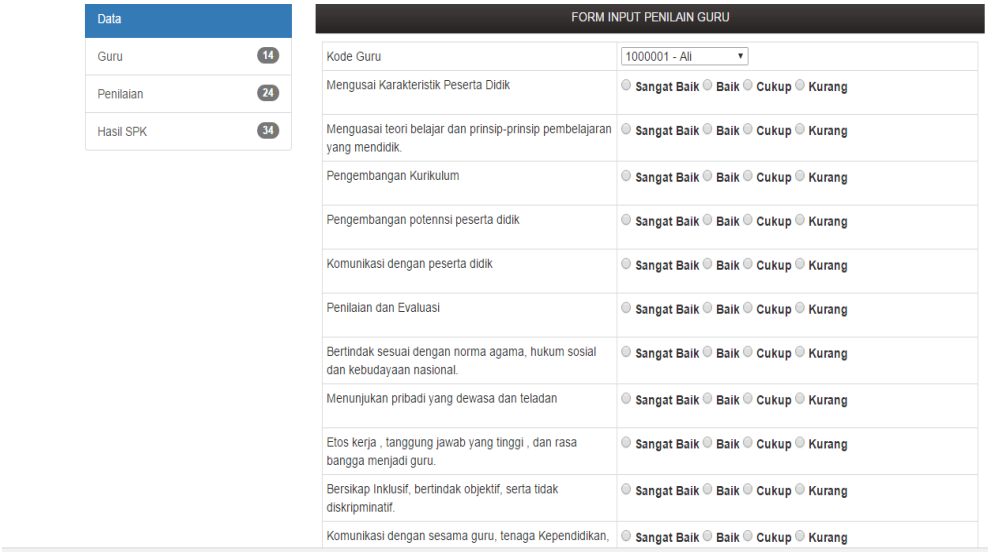
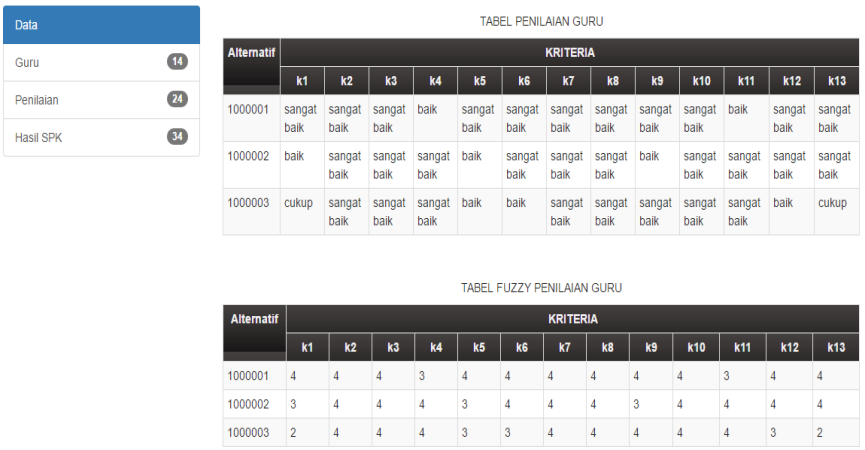


Figure 3. Form Input Valuation Data

The results of the analysis shown are R Normalized Matrix, Y Weighted Normalized Matrix, Positive Ideal Solution (A+), Negative Ideal Solution (A-), The distance between the weighted values of each alternative to the positive ideal solution Si+, the distance between the weighted values of each alternative to the ideal solution negative Si-, the closeness of each alternative to the ideal solution, and the ranking results.



Alternatif	KRITERIA												
	k1	k2	k3	k4	k5	k6	k7	k8	k9	k10	k11	k12	k13
1000001	sangat baik	sangat baik	sangat baik	baik	sangat baik	sangat baik	sangat baik	sangat baik	sangat baik	sangat baik	baik	sangat baik	sangat baik
1000002	baik	sangat baik	sangat baik	sangat baik	baik	sangat baik	sangat baik	sangat baik	baik	sangat baik	sangat baik	sangat baik	sangat baik
1000003	cukup	sangat baik	sangat baik	sangat baik	baik	baik	sangat baik	sangat baik	sangat baik	sangat baik	sangat baik	baik	cukup

Alternatif	KRITERIA												
	k1	k2	k3	k4	k5	k6	k7	k8	k9	k10	k11	k12	k13
1000001	4	4	4	3	4	4	4	4	4	4	3	4	4
1000002	3	4	4	4	3	4	4	4	3	4	4	4	4
1000003	2	4	4	4	3	3	4	4	4	4	4	3	2

Figure 4. Form Process Data

This table is a table for filling out the criteria values for each alternative where the criteria are filled in as many as 13 criteria and the following table is the weight of the criteria that have been filled in previously. After forming the decision matrix, step The next step is to normalize the value of the matrix decision as follows:

TABEL NORMALISASI PERTAMA

Alternatif	KRITERIA												
	k1	k2	k3	k4	k5	k6	k7	k8	k9	k10	k11	k12	k13
1000001	0.74	0.58	0.58	0.47	0.69	0.62	0.58	0.58	0.62	0.58	0.47	0.62	0.67
1000002	0.56	0.58	0.58	0.62	0.51	0.62	0.58	0.58	0.47	0.58	0.62	0.62	0.67
1000003	0.37	0.58	0.58	0.62	0.51	0.47	0.58	0.58	0.62	0.58	0.62	0.47	0.33

BOBOT KEPENTINGAN

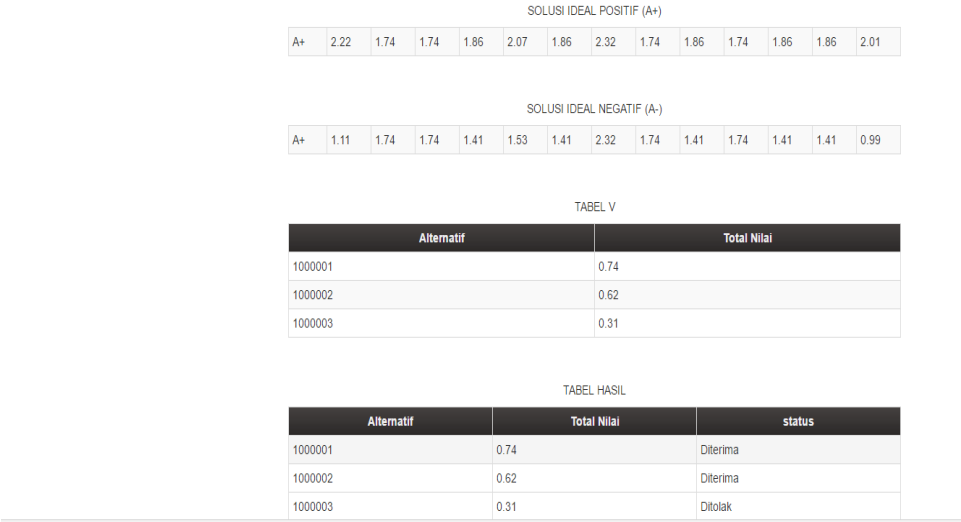
k1	k2	k3	k4	k5	k6	k7	k8	k9	k10	k11	k12	k13
3.00	3.00	3.00	3.00	3.00	3.00	4.00	3.00	3.00	3.00	3.00	3.00	3.00

TABEL NORMALISASI KEDUA

Alternatif	KRITERIA												
	k1	k2	k3	k4	k5	k6	k7	k8	k9	k10	k11	k12	k13
1000001	2.22	1.74	1.74	1.41	2.07	1.86	2.32	1.74	1.86	1.74	1.41	1.86	2.01
1000002	1.68	1.74	1.74	1.86	1.53	1.86	2.32	1.74	1.41	1.74	1.86	1.86	2.01
1000003	1.11	1.74	1.74	1.86	1.53	1.41	2.32	1.74	1.86	1.74	1.86	1.41	0.99

Figure 5. Form Process Data

After obtaining the normalized matrix, then the value in the normalization matrix multiplied by the preference value for each criteria, then determine the positive ideal matrix (+) and the negative ideal matrix (-) Determine the positive ideal matrix (+), then Specifies the preference value for each alternative.



SOLUSI IDEAL POSITIF (A+)

A+	2.22	1.74	1.74	1.86	2.07	1.86	2.32	1.74	1.86	1.74	1.86	1.86	2.01

SOLUSI IDEAL NEGATIF (A-)

A+	1.11	1.74	1.74	1.41	1.53	1.41	2.32	1.74	1.41	1.74	1.41	1.41	0.99

TABEL V

Alternatif	Total Nilai
1000001	0.74
1000002	0.62
1000003	0.31

TABEL HASIL

Alternatif	Total Nilai	status
1000001	0.74	Diterima
1000002	0.62	Diterima
1000003	0.31	Ditolak

Figure 6. *TOPSIS* Method Calculation Result Form

From the calculation results above, the alternative with code 100001, namely Ali, has the highest preference value with a preference value of 0.74, higher than alternative 100002 with a value of 0.62 and alternative 10003 with a value of 0.31. So those who deserve to be accepted as honorary staff are Ali and Syamsia.

4. CONCLUSION

Based on the results of research conducted at the Education Office of North Gorontalo Regency and the discussion that has been described previously, it can be concluded that the Decision Support System for Assigning Honorary Personnel Uses the TOPSIS Method at the Education Office of North Gorontalo Regency Using Pedagogic, Personality, Social and Professional Criteria with Results The analysis displayed is R Normalized Matrix, Y Weighted Normalized Matrix, Positive Ideal Solution (A+), Negative Ideal Solution (A-), The distance between the weighted value of each alternative to the positive ideal solution Si+, the distance between the weighted value of each alternative to the negative ideal solution Si-, the closeness of each alternative to the ideal solution, and the ranking results. From the calculation results above, the alternative with code 100001, namely Ali, has the highest preference value with a preference value of 0.74, higher than alternative 100002 with a value of 0.62 and alternative 10003 with a value of 0.31. So those who deserve to be accepted as honorary staff are Ali and Syamsia.

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