RECOMMENDATIONS FOR PLACEMENT OF INTERNSHIPS IN INDUSTRY WITH THE DISTANCE FROM AVERAGE SOLUTION (EDAS) METHOD BASED ON STUDENT SCORES

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Abstract

Article Info	
Received, 01 Juni 2022 Revised 28 Juni 2022 Accepted 30 Juni 2022	Currently, the Indonesian Ministry of Education has implemented a new rule with every student expected to have an internship in the industry. With the aim of each student being able to understand the situation of the world of work so that preparation before completing a bachelor's degree is stronger. However, one of the problems found is that students cannot determine the placement of internships. This study tries to provide a solution to these problems by applying the rules from the head of the study program to provide recommendations to students. These rules are built based on student academic scores stored in the campus database which is controlled by the head of the study program. The method used is Distance from Average Solution (EDAS). The EDAS method is to determine the highest ranking using PDA is the positive distance from the average and (NDA) is the negative distance from the average. The results of this study provide recommendations automatically in the hope of supporting the current campus academic system. .

Keywords: Recommendations, Placement Industry, Student Intern, EDAS Method.

1. INTRODUCTION

Student internship is an internship activity carried out by students. This activity also supports educational activities on campus by implementing SKS (semester credit units). This means that even though the student during the internship is a requirement and part of the academic part of the campus which is judged by the lecturer or supervisor from the company supervisor later. If students are recommended to take internships in industry, it is hoped that these students can find out the world of work that will be taken when they finish college. Placement of student interns is part of the independent campus. An independent campus simply has the meaning of giving freedom and autonomy to educational institutions, and independence from bureaucratization, lecturers are freed from complicated bureaucracy and students are given the freedom to choose the fields that students like. In order for the program to run better, this research makes a new contribution to the placement of student internships with the recommendation of the head of the study program. The decision of the study program is carried out using the distance from avarange solution (EDAS).

2. METHOD

2.1 Decision Support System

Decision Support System is a technique to automatically make a decision. If a decision is made by deliberation and has a lot of alternatives, it will certainly drain the mind, energy, time and cost. DSS allows users to make decisions for more consistent operations [1] and efficient as well as for monitoring, such as determining outstanding lecturers[2]. Provide knowledge about single tuition [3], Determining the title of the student's thesis [4], predictive maintenance strategy based on machine learning approach [5]. Multi-criteria intelligent decision support system for COVID-19[6]. The purpose of a decision support system, of course, is to achieve a solution of various problems with fast computer-based capabilities.

2.1 Metode EDAS

Metode *Distance from Average Solution* (EDAS) digunakan untuk sistem pendukung keputusan [7][8][9]. The stages of the method are:

1. alternative average [10]

$$AV_j = \frac{\sum_{i=1}^{m} r_{ij}}{m}; j = 1, \ldots, n \qquad (1)$$

Av_j is all the attributest.

2. Average Positive and Negative Distance

$$PDA_{ij} = \frac{\max(0, (r_{ij} - AV_j))}{AV_j}; i=1,\ldots,m, j=1,\ldots,n \qquad (2)$$

$$NDA_{ij} = \frac{\max(0, (AV_j - r_{ij}))}{AV_j}; i=1,\ldots,m, j=1,\ldots,n \qquad (3)$$

PDA adalah Positive Distance Average and dan (NDA) adalah Avarage Negative Distance.

3. Positive and Negative Distance Assessment

$$SP_i = \sum_{j=1}^{n} PDA_{ij}. w_j; i = 1, \ldots, m \qquad (4)$$

$$SN_i = \sum_{j=1}^{n} NDA_{ij}. w_j; i = 1, \ldots, m \qquad (5)$$

SP and SN are attribute weight assessments, and are used to determine the weighted PDA and weighted NDA values for each alternative..

4. Normalization of Weights Distance positive and negative

$$NSP_i = \frac{SP_i}{Max_i(SP_i)}; i = 1, \ldots, m \qquad (6)$$

$$NSN_i = \frac{SP_i}{max_i(SN_i)}; i=1,\ldots,m \qquad (7)$$

NSP and NSN are Considering the attribute weights of PDA and NDA

5. Scoring / ranking

$$AS_i = \frac{1}{2}(NSP_i + NSN_i); i = 1, \ldots, m \qquad (8)$$

AS is the final rank of the alternatives.

3. Results and Discussion
3.1 Criteria

The criteria in this study are computer programming (K1), computer networks (K2), computer databases (K3), computer security (K4), multimedia computer design (K5)..

3.2 Alternatif

An alternative to this system is students who already have the requirements for an internship program. In this case, 5 alternatives will be tested to get recommendations for industrial internships.

3.3 Criteria Weight

The weight of the criteria in this study with the edas method is as follows:

Table 1 Criteria Weight Value

K1	K2	K3	K4	K5
0,35	0,35	0,25	0,15	0,10

If combined, the overall weighted value is 120. After getting the weight of the next criteria, the Student's Overall Criteria Value. The overall criteria value is the value of all criteria combined into 1 table to make calculations easier. The values obtained are as follows:

Table 2 Village Criteria

A	K1	K2	K3	K4	K5
A1	0,75	0,78	0,85	1	0
A2	0,72	0,8	0,86	0,33	1
A3	0,79	0,83	0,85	0,5	0
A4	0,74	0,77	0,87	1	0,5
A5	0,78	0,8	0,85	0,25	1

3.4 Positive and Negative Distance

The positive distance is obtained by combining all the criteria values for each alternative. And subtracting with one alternative then redistributing it with a combination. The value obtained is as follows:

Table 3 Positive Distance Values

A	K1	K2	K3	K4	K5
A1	0,801587	0,80402	0,801402	0,675325	1
A2	0,809524	0,798995	0,799065	0,892857	0,6
A3	0,791005	0,791457	0,801402	0,837662	1
A4	0,804233	0,806533	0,796729	0,675325	0,8
A5	0,793651	0,798995	0,801402	0,918831	0,6

Negative distance is obtained by combining all the criteria values for each alternative. One alternative is subtracted by the combined value then redistributed by the combination or the opposite of the positive distance search. The values obtained are as follows:

Table 4 Negative Distance Value

A	K1	K2	K3	K4	K5
A1	-0,80159	-0,80402	-0,8014	-0,67532	-1
A2	-0,80952	-0,79899	-0,79907	-0,89286	-0,6
A3	-0,79101	-0,79146	-0,8014	-0,83766	-1
A4	-0,80423	-0,80653	-0,79673	-0,67532	-0,8
A5	-0,79365	-0,79899	-0,8014	-0,91883	-0,6

3.5 Distance of Positive and Negative Weights

Jarak bobot positif di dapat dengan mengkalikaan setiap nilai jarak posisitif pada setiap alternatif dengan nilai gabungan.

Table 5 Positive Distance

A	K1	K2	K3	K4	K5
A1	0,200397	0,281407	0,16028	0,067532	0,1
A2	0,202381	0,279648	0,159813	0,089286	0,06
A3	0,197751	0,27701	0,16028	0,083766	0,1
A4	0,201058	0,282286	0,159346	0,067532	0,08
A5	0,198413	0,279648	0,16028	0,091883	0,06

The negative weight distance is obtained by multiplying each negative distance value in each alternative by the combined value.

Table 6 Negative Distance

A	K1	K2	K3	K4	K5
A1	-0,2004	-0,28141	-0,16028	-0,06753	-0,1

A2	-0,20238	-0,27965	-0,15981	-0,08929	-0,06
A3	-0,19775	-0,27701	-0,16028	-0,08377	-0,1
A4	-0,20106	-0,28229	-0,15935	-0,06753	-0,08
A5	-0,19841	-0,27965	-0,16028	-0,09188	-0,06

3.6 Distance Normalization

Positive distance normalization is obtained from the combination of positive weight values and the highest value is taken. Each positive distance value in the alternative is divided by the highest value of the combination.

Table 7 Normalization of Positive Distance

A	Grade
A1	1,011353
A2	1,034988
A3	1
A4	1,036173
A5	1,036171

Negative distance normalization is obtained from the combination of negative weight values and the highest value is taken. Each negative distance value in the alternative is divided by the highest value of the combination.

Table 8 Normalization of Negative Distance

A	Grade
A1	0,976046
A2	0,998856
A3	0,965089
A4	1
A5	0,999998

3.7 Recommended Value

The recommendation value for the internship location is obtained by half (0.5) times the positive and negative normalization values. Each criterion produces the following values.

Table 8 Ranking

A	Grade
A4	1,018086723
A5	1,018084745
A2	1,016921972
A1	0,993699162
A3	0,982544695

After calculating the SPK using the EDAS method, the 4th alternative / list of students eligible to receive a recommendation from the academic side occupies the list of industrial internship places. The previous industrial internship places have been ranked according to the difficulty of entering the industry.

4. CONCLUSIONS

The use of the EDAS method has fulfilled the research objectives, but without using the EDAS method the results showed not much different, the only difference was there. The process of determining the recommendation for industrial internship locations. the computer security criteria are

not very valid, because the value of competence cannot be measured by numbers, so the Gap value greater than 0 or less than 0 will create new confusion, because if there is a gap in computer security criteria, it means standard competence with computer security. of students is not suitable

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