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APPLICATION OF THE PROFILE MATCHING METHOD IN RECOMMENDING DOCTORAL CANDIDATES FOR LECTURER (CASE STUDY AT STMIK ROYAL)

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Abstract: The advancement of information technology and knowledge has facilitated the production of quality information. The use of information technology has penetrated all fields, especially in the teaching domain at higher education institutions, aiding in valuable decision-making processes. This research focuses on STMIK Royal Kisaran, which faces challenges in increasing the number of doctoral-educated lecturers. To address this limitation, the study explores the implementation of a Decision Support System (DSS) using the Profile Matching method. Lecturers in higher education play a crucial role in providing education, conducting research, and contributing to society. In an effort to enhance the qualifications of lecturers, this research designs a Decision Support System using the Profile Matching method. The aim of this research is to provide recommendations for prospective lecturer candidates to pursue a Doctoral degree based on criteria factors such as length of service, functional position, research score, dedication score, age, and recognition score. Data from 46 lecturers at STMIK Royal Kisaran who meet the criteria are used to test the validity and effectiveness of the Decision Support System (DSS). Through structured analysis, it is demonstrated that the Decision Support System using the Profile Matching method successfully provides recommendations for suitable lecturer candidates to pursue doctoral studies.

Keywords : decision support systems; higher education; information Technology; lecturer qualifications; profile matching.

Abstrak: Kemajuan teknologi informasi dan ilmu pengetahuan telah menghadirkan kemudahan dalam menghasilkan informasi yang berkualitas, penggunaan teknologi informasi sudah memasuki segala bidang terutama bidang pengajaran pada perguruan tinggi dan membantu pengambilan keputusan yang bernilai. Penelitian ini berfokus pada STMIK Royal Kisaran yang mengalami kendala dalam meningkatkan jumlah dosen berpendidikan Doktor. Untuk mengatasi keterbatasan tersebut, penelitian ini mengeksplorasi penerapan Sistem Pendukung Keputusan (DSS) dengan menggunakan metode Profile Matching. Dosen pada pendidikan tinggi mempunyai peran penting dalam memberikan pendidikan, melakukan penelitian, dan memberikan kontribusi kepada masyarakat. Dalam upaya meningkatkan kualifikasi dosen, penelitian ini merancang Sistem Pendukung Keputusan dengan menggunakan metode Profile Matching. Penelitian ini bertujuan untuk memberikan rekomendasi kandidat calon dosen untuk mengejar gelar Doktor dengan berlandaskan faktor kriteria seperti lama kerja, jabatan fungsional, nilai penelitian, nilai pengabdian, umur, dan nilai rekognisi. Data dari 46 dosen STMIK Royal Kisaran yang memenuhi kriteria digunakan untuk menguji validitas dan efektivitas Sistem Pendukung Keputusan (SPK). Melalui analisis terstruktur, menunjukkan bahwa Sistem Pendukung Keputusan menggunakan metode Profile Matching berhasil memberikan rekomendasi calon dosen yang layak direkomendasikan untuk melanjutkan studi ke jenjang Doktor.

Kata Kunci : kualifikasi dosen; pencocokan profil; pendidikan yang lebih tinggi; sistem pendukung keputusan; teknologi Informasi.

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INTRODUCTION

Higher education is an official institution in the education system, which is regulated by law to provide learning in various fields such as academic knowledge, practical skills, and professions. The role of universities is very important in creating individuals who are experts and competent in their respective fields. [1] . Information systems and information technology have an important role in this context. [2] .

The provision of education in higher education is very dependent on the contribution of educators. Lecturers, as academic members, have the responsibility to plan, implement and evaluate the learning process, provide guidance to students, and participate in research and service to the community. In accordance with Law of the Republic of Indonesia Number 14 of 2005 concerning Teachers and Lecturers, lecturers have the right to receive awards based on their academic performance.

The doctoral program is the highest level in higher education. Individuals with doctoral degrees are often considered the most qualified and competent human resources. Human resources are the main assets of an organization, which play an active role in planning and implementing every organizational activity [3] .

STMIK Royal is a tertiary institution providing post-secondary education, with the aim of developing tertiary institutions into healthy educational institutions and creating superior and intelligent Human Resources (HR). In accordance with the rules set by the National Accreditation Board for Higher Education (BAN-PT), the current requirement for the number of lecturers being taught is that they must hold a doctoral degree (S3) in each study program. STMIK Royal Kisaran, as one of the educational institutions that is responsive to these challenges, has adopted a strategy through a Masters level lecturer development program to continue their studies to Doctoral level.

However, decision making regarding lecturer eligibility for this program is still subjective, evaluated manually, and not yet supported by a computerized system, which causes potential misunderstandings and jealousy due to the lack of objectivity in assessment. As a step to strengthen this research, the author took previous references such as "Decision Support System for Selection of Outstanding Students Using Web-Based Profile Matching Method (Case Study of SMK Negeri 1 Kefamenanu)" [4] . "Application of the Profile Matching Method in the Decision Support System for Selection of the Best Lecturers (Case Study: South Tapanuli Education Institute)" [1] .

"Decision Support System for the Eligibility of Accepting Quran Tilawatil Teachers Using the Profile Matching Method" [5] . From previous research, it is known that the Profile Matching method is effective in selecting outstanding students and the best lecturers. This indicates that using a Decision Support System with this method can help determine doctoral-level lecturers more objectively.

This method assists in objectively identifying candidates who meet the criteria. By utilizing this method, the research can provide accurate recommendations in selecting lecturers for doctoral studies. The Decision Support System aims to assist in identifying and analyzing issues related to specific information and management systems [6].

Utilizing Decision Support Systems, such as Profile Matching, is seen as a solution to provide objective decisions and clear objectives [7],[8]. This method operates by assuming the ideal level of

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predictor variables that subjects must meet, aiding in faster and more accurate decision-making compared to manual approaches [9],[10],[11]. This research aims to implement the Profile

Matching method in recommending doctoral candidates, with the hope of assisting STMIK Royal in assessing the suitability of Master's level lecturer candidates to pursue doctoral studies.

METHOD

To achieve the objectives of this research, a series of stages must be carried out. The application of the Profile Matching method includes several steps that are in line with the method process, as described below:

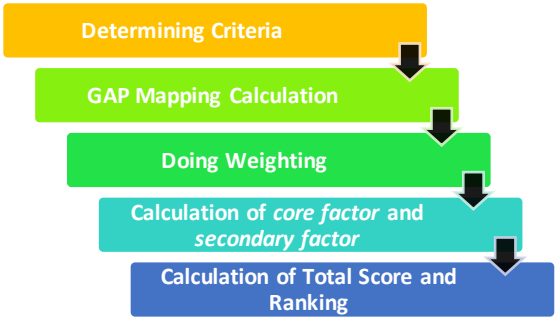

Image 1. Profile Matching Method

Figure 1 illustrates the various stages of the Profile Matching method. These stages include:

Determining Criteria

The Profile Matching method process begins by establishing assessment criteria which include work period, age, functional position, research value, service value and recognition value .

GAP Mapping Calculation

After a weight value is assigned to each criterion, the next step in the system is to calculate the GAP mapping. GAP mapping is carried out to assess the extent of the disparity between the candidate profile and the desired standards for each criterion. The GAP calculation formula can be explained as follows:

GAP = Attribute Value – Target Value (1)

Doing Weighting

After the GAP for each criterion is determined, it is then given a weight. Weights, as shown in Table 1, the weights of the GAP values in Table 1 are determined by the Profile Matching method

Table 1. GAP Value Weights for the Profile Matching Method

Number	Difference	Value Weight	Information
1	0	5	Competencies as needed
2	1	4.5	Location competency is 1 level excess
3	-1	4	Location competency is 1 level/level short
4	2	3.5	Location competency is 2 levels/level superior
5	-2	3	Short location competency 2 levels/level
6	3	2.5	Location competency is 3 levels superior
7	-3	2	Location competency is lacking at 3 levels
8	4	1.5	Location competency is 4 levels superior
9	-4	1	Location competency in short is 4 levels

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Core Factor Calculation and Secondary Factors

After the GAP weight value is obtained, the next step is to calculate the core factor and secondary factor . This calculation can be clarified through the following equation:

Core factor

Core factors represent the most prominent or very essential aspects. The core factor calculation is carried out using the formula:

$$NCF = \frac{\sum NC}{\sum IC} \quad (2)$$

NCF is the average value of the core factor, NC shows the total value of the core factor , and IC determines the number of core factor items .

Secondary factors

Secondary factors refer to supporting elements. To calculate secondary factor , use the following formula:

$$NSF = \frac{\sum NS}{\sum IS} \quad (3)$$

NSF indicates the average value of the secondary factor , NS represents the cumulative value of the secondary factor , and IS indicates the quantity of items related to the secondary factor .

Calculation of Total Score and Ranking

Calculating the total score requires combining the scores obtained from the core factors and secondary factors. The overall score for each aspect is determined using the following formula:

$$N = (X)\% .NCF + (Y)\% NSF \quad (4)$$

N represents the total value of each aspect, NCF is the average value of the core factor, NSF represents the average value of the secondary factor, (X)% represents the percentage value of the core factor and (Y)% represents the percentage value of the secondary factor . Meanwhile, to get the ranking, use the formula:

$$Rank = (x)\% .Na1 + (x)\% .Na2 + (x)\% .Na3 \quad (5)$$

Na1 represents the Aspect 1 value, Na2 represents the Aspect 2 value, Na3 represents the Aspect 3 value, and (X) represents the entered percentage value.

RESULTS AND DISCUSSION

The results and discussion include analysis of data that has been processed using the Profile Matching method through several stages:

Determining Criteria

In this research, there are six criteria as outlined in Table 2.

Table 2. Determination of Criteria

Number	Criteria	Criteria Code
1	Length of working	C1
2	Functional	C2
3	Research Value	C3
4	Value of Devotion	C4
5	Age	C5
6	Recognition Value	C6

Table 3. Criteria Data and Target Values

code	criterion name	assessment criteria	%	target value
C1	Length of working	Factor	60	3
C2	Functional	Factor		2
C3	Research Value	Factor		3
C4	Value of Devotion	Factor		3
C5	Age	Secondary	40	3
C6	Recognition Value	Secondary		3

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Table 3 contains a table of sub criteria data, types of criteria factors and target values. The following are the sub criteria data that will be processed in this research

Table 4. Sub-Criteria Weight Values

Criteria	Sub Criteria	Mark
Length of working	6 – 8 Years	1
	9 – 11 Years	2
	12 – 20 Years	3
Functional	Lecturer 200	1
	Lecturer 300	2
Research Value	0 - 2.5	1
	2.6 - 6	2
	6.1 - 20	3
Value of Devotion	0 - 3	1
	3.1 - 6	2
	6.1 - 11	3
Age	30 - 35 Years	1
	36 - 40 Years	2
	41 - 53 Years	3
Recognition Value	0 - 0.3	1
	0.4 - 1	2
	1.1 - 3	3

GAP Mapping Calculation

Table 5. Sub-Criteria Weight Values

Number	Alternative	Criteria					
		C1	C2	C3	C4	C5	C6
1	E.R	1	1	2	3	3	2
2	E.S	3	2	3	1	3	1
3	F.D	1	2	3	3	2	2
4	G.M.P	2	2	3	2	2	1
5	H.S	3	2	3	1	2	1
6	J.E.H	3	1	2	2	3	1
7	R	3	1	2	3	3	2
8	R.Y	3	2	1	2	2	3
9	W.M.K	3	2	3	2	3	2
10	Y.S	3	1	1	1	3	3

Table 5. performs GAP mapping calculations. by displaying the weighted sub-criteria values in table 4, where the data in table 5 is initial data obtained from the agency.

Weighting stage

The weight value of the criteria has known, then a calculation is carried out to find the GAP where to find the GAP refers to formula (1).

Table 6. Calculation of GAP Values

Number	Alternative	Criteria						
		C1	C2	C3	C4	C5	C6	
1	A1	1	1	2	3	3	2	**Criterion Value**
2	A2	3	2	3	1	3	1	
3	A3	1	2	3	3	2	2	
4	A4	2	2	3	2	2	1	
5	A5	3	2	3	1	2	1	
6	A6	3	1	2	2	3	1	
7	A7	3	1	2	3	3	2	
8	A8	3	2	1	2	2	3	
9	A9	3	2	3	2	3	2	
10	A10	3	1	1	1	3	3	
Target Value		**3**	**2**	**3**	**3**	**3**	**3**	
1	A1	-2	-1	-1	0	0	-1	**GAP Value**
2	A2	0	0	0	-2	0	-2	
3	A3	-2	0	0	0	-1	-1	
4	A4	-1	0	0	-1	-1	-2	
5	A5	0	0	0	-2	-1	-2	
6	A6	0	-1	-1	-1	0	-2	
7	A7	0	-1	-1	0	0	-1	
8	A8	0	0	-2	-1	-1	0	
9	A9	0	0	0	-1	0	-1	
10	A10	0	-1	-2	-2	0	0	

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After obtaining the GAP value for each alternative, it is then given a weight based on Table 1. Transforming the GAP value into weight will produce a weight value for each alternative. The results of this conversion display the GAP value for each alternative, as presented in Table 7.

Table 7. GAP Criteria Weight Values

Number	Code	Criteria						
		C1	C2	C3	C4	C5	C6	
1	A1	3	4	4	5	5	4	**GAP Value Weighting**
2	A2	5	5	5	3	5	3	
3	A3	3	5	5	5	4	4	
4	A4	4	5	5	4	4	3	
5	A5	5	5	5	3	4	3	
6	A6	5	4	4	4	5	3	
7	A7	5	4	4	5	5	4	
8	A8	5	5	3	4	4	5	
9	A9	5	5	5	4	5	4	
10	A10	5	4	3	3	5	5	

Referring to Table 7, you can see the weight of the GAP values obtained. The weights in Table 7 are in accordance with Table 1, where each GAP value has been given a certain weight which is determined using the Profile Matching method. Therefore, in Table 7 it can be seen that each alternative, namely the 10 data samples used, has a different GAP weight value.

Calculation of Core Factor and Secondary Factor

When all the GAP value weights are obtained, the core factor and secondary factor calculations are then carried out. The process of determining the core factor value follows formulas (2) and (3) so that the values in Table 8 are obtained.

Table 8. Core Factor and Secondary Factor Calculation Results

Number	Code	NCF	NCF
1	A1	4	4.5
2	A2	4.5	4
3	A3	4.5	4
4	A4	4.5	3.5
5	A5	4.5	3.5
6	A6	4.25	4
7	A7	4.5	4.5
8	A8	4.25	4.5
9	A9	4.75	4.5
10	A10	3.75	5

The next, obtaining the core factor value and secondary factor value , the next step is to calculate the total value obtained from the calculation above, then arrange it in descending order based on the highest total value. This is done to obtain a ranking order and determine who occupies the top rank.

Table 9. Results of Total Score and Highest Ranking

Number	Code	Lecturer Name	Total value	Rank
1	A9	W.M.K	4.65	1
2	A7	R	4.5	2
3	A8	R.Y	4.35	3
4	A2	E.S	4.3	4
5	A3	F.D	4.3	5
6	A10	Y.S	4.25	6
7	A1	E.R	4.2	7
8	A6	J.E.H	4.15	8
9	A5	H.S	4.1	9
10	A4	G.M.P	4.1	10

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Based on Table 9, it can be seen that alternative code A9 has the highest final result value, namely 4.65.

TESTING

Testing was carried out using a system developed with the PHP and MySQL programming languages. The purpose of this test is to validate the decision making process using the Profile Matching method. This process will undergo manual evaluation, and the results will be compared with tests carried out using the system, aiming to obtain consistent results between manual calculations and the system.

Administrator Page

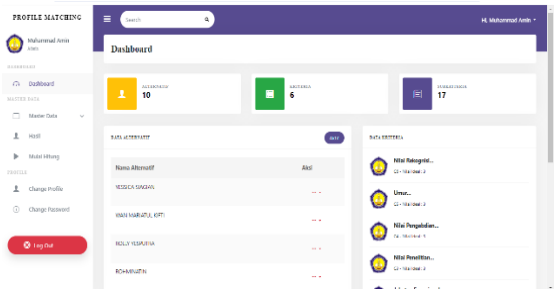

Image 2. Administrator page

The administrator page functions as a front interface that displays the master data menu. The menu consists of a criteria display for entering criteria, an alternative display for entering alternatives, and a factor display for entering percentages of core factors and secondary factors.

Start Calculation Menu

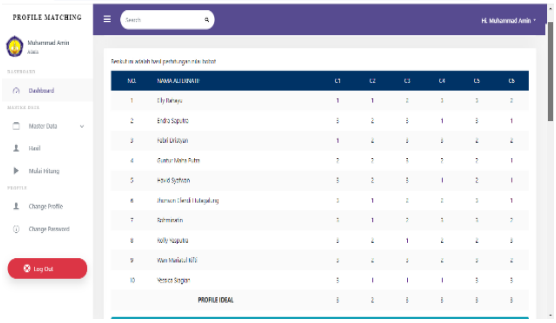

Image 3. Start Calculation Menu

The "Start Calculation" menu is designed to display the results of calculating criteria weight values, GAP values, as well as the results of calculating core factors and secondary factors.

Results Menu

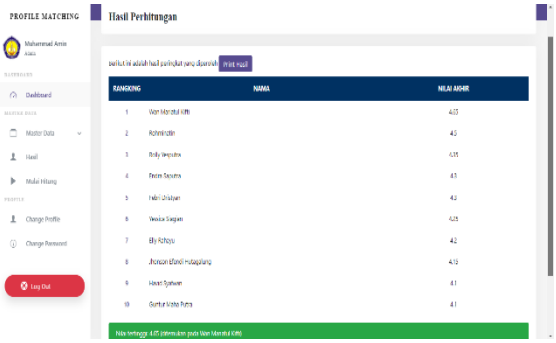

Image 4. Results Menu

The calculation results of the decision-making system using the profile matching method show that the top six candidates obtained have alternative codes (A9), (A7), (A8), (A2), (A3), and (A10). The lecturer with alternative code (A9) achieved the first rank with a total score of 4.65, thus deserving recommendation for further studies at the doctoral level.

CONCLUSION

Research findings show that the Profile Matching method has been successfully used to support the decision-making process, providing recommendations for prospective lecturers who are worthy of continuing their doctoral level studies. In this study, from a sample of 10 lecturers, alternative A9 occupied the top position with the highest score of 4.65, while alternative A4 received the lowest score of 4.1.

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