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Application of the Combination of SMART and TOPSIS Methods in the Decision Support System for the Selection of KIP-K Recipients in Students of the Islamic University of Balitar

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ABSTRACT

This research aims to develop a decision support system that combines the Simple Multi-Attribute Rating Technique (SMART) method and the Technique for Order of Preference by Similarity to the Ideal Solution (TOPSIS) in the selection process for recipients of the Indonesia Smart Lecture Card (KIP-K) at the Islamic University of Balitar. The KIP-K program is an initiative of the Indonesian government to provide financial assistance to students with economic limitations but high academic potential, aiming to increase access to higher education for the underprivileged. However, in the implementation at the Islamic University of Balitar, there was an obstacle when several students who should have met the requirements and were entitled to receive the KIP-Lecture did not get it. The process without a structured calculation method and the calculation of data that is carried out individually are the main problems. This study collected and analyzed data on prospective KIP-K recipients with a decision support system developed. The research stages include data collection, normalization of criterion weights using the SMART method, and calculating priority scores using the TOPSIS method. The results of this system are measured using a confusion matrix to evaluate the recommendation's accuracy. Using a confusion matrix shows that the resulting recommendation system has an accuracy rate of around 94.92%, precision of around 93.75%, recall of around 93.75%, and F1-score of 93.75, which is included in the excellent classification. This proves that combining methods can provide results based on the selection needs of KIP-K recipients at the Islamic University of Balitar.

1. Introduction

Education is an important element in a country's growth because it increases the people's intelligence. One educational program organized is the Indonesia Smart Program (PIP), which includes assistance through the Indonesia Smart Lecture Card (KIP-K)[1]. The Indonesia Smart Lecture Card (KIP-K) is an educational, financial aid initiative aimed at prospective students with economic limitations who show good academic potential and want to continue their studies in higher education. The Ministry of Research, Technology, and Higher Education sets criteria for scholarship recipients [2]. Indonesia's government provides financial support for education from primary to high school, but the cost of higher education is considered high, especially for people with low economic levels. Many high school graduates in D3, D4, and S1 programs do not continue to college [3]. To overcome this, the government seeks to reduce it by assisting with education fees of ten, known as scholarships. Scholarship is a funding program provided by the government for individuals who face economic constraints to allow them to continue their education. Budiyono et al., the provision of scholarships is expected to be on target so that students who cannot afford it can benefit from appropriate education [4].

The Government of Indonesia has initiated the Indonesia Smart Lecture Card (KIP-K) program to help ease education costs. One of the universities that organizes the KIP-Lecture scholarship program is the Islamic University of Balitar. The KIP-Lecture program is designed to increase access and learning

opportunities for prospective students at colleges or universities. However, in the implementation at the Islamic University of Balitar, there was an obstacle when several students who should have met the requirements and were entitled to receive the KIP-Lecture did not get it. The process is still manual, without a structured calculation method, and the data calculation is carried out individually, which is the main problem. This shows gaps or obstacles in the selection process of KIP-Lecture recipients, which can impact the availability of access to education for students in need. According to Pratiwi in the research by Shodik et al., a computer system that works with decision-makers and uses models and data to solve unstructured problems is known as a decision support system. One example is a recommendation system, which aims to provide suggestions that align with user preferences [5]. Therefore, a more effective and efficient approach is needed to determine the selection of KIP-Lecture recipients so that they are right on target. Implementing the Decision Support System (DSS) is suitable for providing solutions in situations with many criteria or multicriteria in decision-making (MDM) [6]. The findings of this study [7] show that using a Decision Support System (DSS) with the TOPSIS method improves accuracy, effectiveness, and efficiency in selecting scholarship recipients by considering various criteria. According to [8] by using the SMART method, the system can rank scholarship candidates' scores accurately and objectively. Testing with ten sample data points shows that the decision support system provides consistent and reliable results.

According to Hutagalung et al.'s research, efforts were made to integrate the SMART and TOPSIS methods to evaluate the quality of rice varieties based on a number of criteria that have been set [9]. The SMART method helps decision-makers choose options aligned with their goals. Each alternative has attributes with averaged values, and each attribute has a significance level indicating its importance compared to others[10]. The TOPSIS method ranks preferences based on similarity to the ideal solution. The ideal solution, or positive ideal, maximizes the benefits of attributes while minimizing costs, while the negative ideal minimizes benefits and maximizes costs. TOPSIS identifies the optimal alternative as the one closest to the positive ideal and furthest from the negative ideal[11]. The combination of these two methods is expected to produce a more precise determination regarding the quality of the variety. This study involves assessing the normalization of the matrix for each attribute using the SMART method, then continuing with the application of the TOPSIS method to determine the selected alternative or solution.

This study employs a combination of SMART and TOPSIS methods, which is considered a potential approach because SMART provides a clear framework to establish appropriate selection criteria. At the same time, TOPSIS aids in calculating the relative priority score of each candidate and utilizes a confusion matrix to measure the accuracy of the results. Therefore, the researcher formulated several research questions: 1) How can the combination of SMART and TOPSIS methods be applied in developing a decision support system to assist in selecting KIP-K recipients for students of the Islamic University of Balitar? 2) What is the accuracy of the recommendation system resulting from applying the combined methods in assisting the selection of KIP-K recipients at the Islamic University of Balitar? Additionally, this study aims to determine the effectiveness of applying the SMART and TOPSIS methods in developing a decision support system for selecting KIP-K recipients at the Islamic University of Balitar using the confusion matrix indicator. Integrating these two methods can provide a solid basis for more precise and objective decision-making in determining the recipients of the Indonesia Smart Lecture Card (KIP) at the Islamic University of Balitar.

2. Methods

This type of research uses a quantitative approach. According to Sugiyono, quantitative research refers to a positivist paradigm that uses concrete data in the form of numbers, which are analyzed using statistical tools to measure and evaluate the problem being researched and reach a conclusion [12]. In

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this study, the data collection technique used is direct data collection from scholarship agencies with observation stages to the research location and interviews with the KIP UNISBA team; from the interview process, the researcher collects the necessary data. The samples in this study are several criteria and alternatives that are the basis for the calculation of the selection of KIP recipients; the sample was obtained from the UNISBA KIP team and used 13 criteria and 118 alternatives for prospective students who will receive the Smart Indonesia Card (KIP) in 2023. This study also uses secondary data as information obtained by researchers indirectly or previously available [13]. Secondary data refers to prospective Smart Indonesia Card scholarship recipients in 2023. Once the relevant data is collected, it will be processed using an approach that combines SMART and TOPSIS methods. In the SMART method, calculations are carried out to determine the weight of the criteria and normalize the weight of the criteria. The scholarship team of the Islamic University of Balitar has determined the weight of the number of criteria in this study. The next step involves the TOPSIS method, where the process includes the normalization calculation of the decision matrix, the identification of the matrix of positive ideal solutions and the negative ideal solution, as well as the sorting of alternatives based on priority, and finally, calculating the level of accuracy using the confusion matrix.

3. Results and Discussions

3.1. System Data

a. Criteria for Determining KIP Recipients

There are 13 criteria used in the process of determining KIP recipients. For this data, the Criteria weight values must all be the same. It is done by ensuring that the overall weight is 100. That is, dividing the overall weight by the total criteria $\frac{100}{13}$, the result is 7.6923.

Table 1. Criteria data

Code	Criteria	Weight	Information
C1	DTKS	7.6923	Benefit
C2	P3KE	7.6923	Benefit
C3	PKH	7.6923	Benefit
C4	BPNT	7.6923	Benefit
C5	PBI	7.6923	Benefit
C6	PBI	7.6923	Benefit
C7	Achievement	7.6923	Benefit
C8	BPUM	7.6923	Benefit
C9	KIS	7.6923	Benefit
C10	Basic Food Assistance	7.6923	Benefit
C11	Pre-employment	7.6923	Benefit
C12	Father	7.6923	Cost
C13	Mother	7.6923	Cost

Information:

C1. DTKS : Integrated Social Welfare Data
C2. P3KE : Accelerating the Elimination of Extreme Poverty
C3. PKH : Family Hope Program
C4. BPNT : Non-Cash Food Assistance
C5. PBI : Recipient of Contribution Assistance
C6. KIP : Smart Indonesia Card
C7. BPUM : Productive Assistance for Micro Enterprises
C8. KIS : Healthy Indonesia Card

b. Alternative Candidate for KIP Recipient

There is an alternative list that lists 118 alternative students who are prospective KIP recipients in 2023.

Table 2. Alternative Data.

Code	Alternative
A1	ADL
A2	MH
A3	AS
A4	PDA
A5	HKN
A6	WYM
A7	ASP
A8	ABIL
A9	HN
A10	DRF
…	…
A118	PAM

c. Matrix Data Values

Table 3 represents the matrix data values or the evaluation of each criterion. Code A1-A118 represents the alternatives, while code C1-C13 represents the criteria. It is the influence between the alternative and each Criterion. With the description, the value of 5 has these criteria, while the value of 1 does not have these criteria.

Table 3. Matrix Data Values

Alternative	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	…	C13
A1	5	5	5	5	5	5	5	1	1	5	…	5
A2	5	5	5	5	5	5	5	1	5	1	…	5
A3	5	5	5	5	5	5	1	1	5	5	…	5
A4	5	5	5	5	5	5	1	1	5	5	…	5
A5	5	5	5	5	5	5	1	1	5	5	…	5
A6	5	5	5	5	5	5	1	1	5	5	…	5
A7	5	5	5	5	5	5	1	1	5	5	…	5
A8	5	5	5	5	5	5	1	1	5	5	…	5
A9	5	5	5	5	5	5	1	1	5	5	…	5
A10	5	5	5	5	5	5	1	1	5	5	…	5
…	…	…	…	…	…	…	…	…	…	…	…	…
A118	1	1	1	1	1	1	1	1	1	1	…	5

3.2. Calculation Results

a. Normalization of Criteria Weights

The normalization of the Criteria weights is calculated based on equation, namely by dividing the value of each weight by the total number of weight values. Here are the results of the calculations.

$$C_1 = \frac{7.6923}{99.9999} = 0.076923077$$

$$C_2 = \frac{7.6923}{99.9999} = 0.076923077$$

$$C_3 = \frac{7.6923}{99.9999} = 0.076923077$$

etc.

Table 4. Normalization of Criteria Weights

Code	Criteria	Information	Weight	Normalization
C1	DTKS	Benefit	7.6923	0.076923077
C2	P3KE	Benefit	7.6923	0.076923077
C3	PKH	Benefit	7.6923	0.076923077
C4	BPNT	Benefit	7.6923	0.076923077
C5	PBI	Benefit	7.6923	0.076923077
C6	PBI	Benefit	7.6923	0.076923077
C7	Achievement	Benefit	7.6923	0.076923077
C8	BPUM	Benefit	7.6923	0.076923077
C9	KIS	Benefit	7.6923	0.076923077

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Code	Criteria	Information	Weight	Normalization
C10	Basic Food Assistance	Benefit	7.6923	0.076923077
C11	Pre-employment	Benefit	7.6923	0.076923077
C12	Father	Cost	7.6923	0.076923077
C13	Mother	Cost	7.6923	0.076923077
Total			**99.9999**	**1**

b. Normalized Decision Matrix Value (r)

(1) Finding the divisor

The normalized decision matrix value is calculated based on formula below

C_1 (divider) = $\sqrt{5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 , \ldots 1^2}$= 51.59457336

C_2 (divider) = $\sqrt{5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 + 5^2 , \ldots 1^2}$= 45.93473631

etc.

Table 5. Calculating the Divisor for Each Criterion

Code	C1	C2	C3	C4	C5	…	C13
A1	5	5	5	5	5	…	5
A2	5	5	5	5	5	…	5
A3	5	5	5	5	5	…	5
A4	5	5	5	5	5	…	5
A5	5	5	5	5	5	…	5
A6	5	5	5	5	5	…	5
A7	5	5	5	5	5	…	5
A8	5	5	5	5	5	…	5
A9	5	5	5	5	5	…	5
A10	5	5	5	5	5	…	5
…	…	…	…	…	…	…	…
A118	1	1	1	1	1	…	5
Divider	**51.5945733**	**45.9347363**	**32.0936130**	**32.093613**	**37.6031913**		**54.31390246**

c. Normalized Decision Matrix Value (r)

The calculation is performed by dividing the alternative values for each criterion by the divisor values in Table 5.

$$A_{1,1} = \frac{5}{51.59457336} = 0.096909417$$

$$A_{2,1} = \frac{5}{51.59457336} = 0.096909417$$

$$A_{3,1} = \frac{5}{51.59457336} = 0.096909417$$

etc.

Table 6. Normalized Decision Matrix Value (*r)*

Code	C1	C2	C3	C4	C5	…	C13
A1	0.096909417	0.108850086	0.155794238	0.155794238	0.132967438	…	0.092057462
A2	0.096909417	0.108850086	0.155794238	0.155794238	0.132967438	…	0.092057462
A3	0.096909417	0.108850086	0.155794238	0.155794238	0.132967438	…	0.092057462
A4	0.096909417	0.108850086	0.155794238	0.155794238	0.132967438	…	0.092057462
A5	0.096909417	0.108850086	0.155794238	0.155794238	0.132967438	…	0.092057462
A6	0.096909417	0.108850086	0.155794238	0.155794238	0.132967438	…	0.092057462
A7	0.096909417	0.108850086	0.155794238	0.155794238	0.132967438	…	0.092057462
A8	0.096909417	0.108850086	0.155794238	0.155794238	0.132967438	…	0.092057462
A9	0.096909417	0.108850086	0.155794238	0.155794238	0.132967438	…	0.092057462
A10	0.096909417	0.108850086	0.155794238	0.155794238	0.132967438	…	0.092057462
…	…	…	…	…	…	…	…
A118	0.019381883	0.021770017	0.031158848	0.031158848	0.026593488	…	0.092057462

d. Weighted Normalization Matrix Value (Y)

The calculation of the weighted normalization matrix is calculated based on equation below, which is multiplying the normalization of the Criteria weights by the value of *r*.

$$A_{1,1} = 0.076923077 \times 0.096909417 = 0.007454571$$
$$A_{2,1} = 0.076923077 \times 0.096909417 = 0.007454571$$
$$A_{3,1} = 0.076923077 \times 0.096909417 = 0.007454571$$

etc.

Table 7. Weighted Normalization Matrix (Y).

Code	C1	C2	C3	C4	C5	…	C13
A1	0.007454571	0.008373084	0.011984172	0.011984172	0.010228264	…	0.007081343
A2	0.007454571	0.008373084	0.011984172	0.011984172	0.010228264	…	0.007081343
A3	0.007454571	0.008373084	0.011984172	0.011984172	0.010228264	…	0.007081343
A4	0.007454571	0.008373084	0.011984172	0.011984172	0.010228264	…	0.007081343
A5	0.007454571	0.008373084	0.011984172	0.011984172	0.010228264	…	0.007081343
A6	0.007454571	0.008373084	0.011984172	0.011984172	0.010228264	…	0.007081343
A7	0.007454571	0.008373084	0.011984172	0.011984172	0.010228264	…	0.007081343
A8	0.007454571	0.008373084	0.011984172	0.011984172	0.010228264	…	0.007081343
A9	0.007454571	0.008373084	0.011984172	0.011984172	0.010228264	…	0.007081343
A10	0.007454571	0.008373084	0.011984172	0.011984172	0.010228264	…	0.007081343
…	…	…	…	…	…	…	…
A118	0.001490914	0.001674617	0.002396834	0.002396834	0.002045653	…	0.007081343

e. Positive Ideal Solution Matrix and Negative Ideal Solution Matrix (D)

The rules in the matrix of positive ideal solutions and negative ideal solutions can be seen in the explanation below.

y+ = Maximum value of the weighted criteria values

y- = Minimum value of the weighted criteria values

Table 8. Positive and negative ideals.

A+	0.007 4545 71	0.008 3730 84	0.011 9841 72	0.011 9841 72	0.010 2282 64	0.008 4211 13	0.013 1000 52	0.007 0813 43	0.012 1262 82	0.014 3537 19	0.007 0813 43	0.001 4976 81	0.007 0813 43
A-	0.001 4909 14	0.001 6746 17	0.002 3968 34	0.002 3968 34	0.002 0456 53	0.001 6842 23	0.002 6200 1	0.007 0813 43	0.002 4252 56	0.002 8707 44	0.007 0813 43	0.007 4884 04	0.007 0813 43

f. Alternative Distance from the Positive Ideal Solution Matrix and Negative Ideal Solution

The formulas below determine the distance of alternative values from the positive ideal solution matrix and the negative ideal solution matrix.

$$D1^{+} = \sqrt{\begin{array}{l}(0.007454571 - 0.007454571)^2 + (0.008373084 - 0.008373084)^2 \\ + (0.011984172 - 0.011984172)^2 + (0.011984172 - 0.011984172)^2 \\ + (0.010228264 - 0.010228264)^2 + (0.008421113 - 0.008421113)^2 \\ + (0.013100052 - 0.013100052)^2 + (0.007081343 - 0.007081343)^2 \\ + (0.012126282 - 0.002425256)^2 + (0.014353719 - 0.014353719)^2 \\ + (0.007081343 - 0.007081343)^2 + (0.001497681 - 0.007488404)^2 \\ + (0.007081343 - 0.007081343)^2\end{array}} = 0.000129999$$

$$D1^{-} = \sqrt{\begin{array}{l}(0.007454571 - 0.001490914)^2 + (0.008373084 - 0.001674617)^2 \\ + (0.011984172 - 0.002396834)^2 + (0.011984172 - 0.002396834)^2 \\ + (0.010228264 - 0.002045653)^2 + (0.008421113 - 0.001684223)^2 \\ + (0.013100052 - 0.00262001)^2 + (0.007081343 - 0.007081343)^2 \\ + (0.012126282 - 0.002425256)^2 + (0.014353719 - 0.002870744)^2 \\ + (0.007081343 - 0.007081343)^2 + (0.007488404 - 0.007488404)^2 \\ + (0.007081343 - 0.007081343)^2\end{array}} = 0.016610376$$

The overall results of the calculation of the positive ideal solution matrix and the negative ideal solution matrix are displayed in the table.

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Table 9. Positive and Negative Ideal Distance Values (D)

D1+	0.000129999	D1-	0.016610376
D2+	0.000167747	D2-	0.016572627
D3+	0.00014572	D3-	0.016594654
D4+	0.00014572	D4-	0.016594654
D5+	0.00014572	D5-	0.016594654
D6+	0.00014572	D6-	0.016594654
D7+	0.00014572	D7-	0.016594654
D8+	0.00014572	D8-	0.016594654
D9+	0.00014572	D9-	0.016594654
D10+	0.00014572	D10-	0.016594654
…	…	…	…
D118+	0.016740374	D118-	0

g. Preference Value (V) and Ranking

The Preference value (V) and ranking are calculated based on the equation below

$$V1 = \frac{0.016610376}{0.016610376 + 0.000129999} = 0.992234423$$

$$V2 = \frac{0.016572627}{0.016572627 + 0.000167747} = 0.989979467$$

$$V3 = \frac{0.016594654}{0.016594654 + 0.00014572} = 0.991295294$$

Table 10. Preference value (V) and ranking

Alternative	Preference	Rank
V1	0,992234423	2
V2	0,989979467	12
V3	0,991295294	3
V4	0,991295294	4
V5	0,991295294	5
V6	0,991295294	6
V7	0,991295294	7
V8	0,991295294	8
V9	0,991295294	9
V10	0,991295294	10
…	…	…
V118	0	118

h. Test Results

This test was carried out to determine the level of closeness between the results of the calculation of the combination of the SMART and TOPSIS methods with the calculations from the KIP UNISBA team by comparing the calculations of the KIP team and the calculations of the combination of the SMART and TOPSIS methods.

Table 11. Comparative Testing

SMART TOPSIS Calculation	KIP Team Calculation	Suitable/Not Suitable
AAT	AAT	Appropriate
ADS	ADS	Appropriate
AA	AA	Appropriate
AD		Not Suitable
ASP	ASP	Appropriate
ADL	ADL	Appropriate
ABILD	ABILD	Appropriate
AN	AN	Appropriate
AS	AS	Appropriate
AN	AN	Appropriate

SMART TOPSIS Calculation	KIP Team Calculation	Suitable/Not Suitable
AT	AT	Appropriate
ARD	APR	Appropriate
	ARD	Not Suitable
SO	SO	Appropriate
THAT	THAT	Appropriate
DSPA	DSPA	Appropriate
	ALSO	Not Suitable
DRF	DRF	Appropriate
DF	DF	Appropriate
	DCP	Not Suitable
EAS	EAS	Appropriate
ESR	ESR	Appropriate
FKWD	FKWD	Appropriate
HN	HN	Appropriate
HKN	HKN	Appropriate
IZK	IZK	Appropriate
IDSNJ	IDSNJ	Appropriate
LR	LR	Appropriate
LDO	LDO	Appropriate
MRW	MRW	Appropriate
MSM		Not Suitable
MAD	MAD	Appropriate
MH	MH	Appropriate
NWS	NWS	Appropriate
NS		Not Suitable
NMP	NMP	Appropriate
PBSK	PBSK	Appropriate
PDA	PDA	Appropriate
RAA	RAA	Appropriate
RA	RA	Appropriate
RAA	RAA	Appropriate
RN	RN	Appropriate
RA	RA	Appropriate
RN	RN	Appropriate
SNH	SNH	Appropriate
SDL	SDL	Appropriate
SCM	SCM	Appropriate
SR	SR	Appropriate
WYM	WYM	Appropriate
WA	WA	Appropriate
YI	YI	Appropriate

There are 48 KIP recipients. Of the 48 students, 45 were suitable, and 6 were non-compliant. From the results that did not match, 3 students were accepted through the calculation of the KIP team. However, they were accepted through the calculation of SMART and TOPSIS and 3 students were accepted through the calculation of the SMART and TOPSIS methods but were not accepted through the calculation of the KIP team. Confusion matrix is commonly used to calculate accuracy in data mining or decision support systems. At this stage, the researcher will measure the performance of the SMART and TOPSIS methods using confusion matrix testing by looking for accuracy, precision, recall, and F1-score [14].

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Table 12. Confusion Matrix *Testing*.

	KIP Recipient Prediction (Positive)	Prediction of Not Receiving KIP (Negative)
KIP Recipient (Positive)	True Positive (TP) = 45	False Negative (FN) = 3
Not a KIP Recipient (Negative)	False Positive (FP) = 3	True Negative (TN) = 67

$$\text{Accuracy} = \frac{TP+TN}{TP+TN+FP+FN}$$
$$= \frac{45+67}{45+67+3+3}$$
$$= \frac{112}{118}$$
$$= 0.9492 \times 100\%$$
$$= 94.92\%$$

$$\text{Precision} = \frac{TP}{TP+FP}$$
$$= \frac{45}{45+3}$$
$$= \frac{45}{48}$$
$$= 0.9375 \times 100\%$$
$$= 93.75\%$$

$$\text{Recall} = \frac{TP}{TP+FN}$$
$$= \frac{45}{45+3}$$
$$= \frac{45}{48}$$
$$= 0.9375 \times 100\%$$
$$= 93.75\%$$

$$\text{F1-score} = 2 \times \frac{\text{Recall x Precision}}{\text{Recall+ Precision}}$$
$$= 2 \times \frac{0.9375 \; x \; 0.9375}{0.9375 + 0.9375}$$
$$= 2 \times \frac{0.87890625}{1.875}$$
$$= 2 \times 0.46875$$
$$= 0.9375 \times 100\%$$
$$= 93.75\%$$

From the test conducted using the confusion matrix, Accuracy results are around 94.92%, precision is around, recall is around 93.75%, and F1-score is 93.75%. High accuracy indicates the model's ability to classify precisely, while precision, recall, and balanced F1-score indicate the model's ability to identify well. From these results, the combination of the SMART and TOPSIS methods is included in the excellent classification according to the accuracy performance scale based on Gorunescu's opinion, which is divided into five groups, namely [15]:

Table 13. Excellent Classification Results

Range	Classification
0.90 – 1.00	: Excellent Classification;
0.80 – 0.90	: Good Classification;
0.70 – 0.80	: Fair Classification;
0.60 – 0.70	: Poor Classification;
0.50 – 0.60	: Failure

4. Conclusion

Based on the results of the research conducted by the author regarding the application of the combination of the Simple Multi-Atribute Rating Technique (SMART) and the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) in the decision support system for the selection of KIP-K recipients for students of the Islamic University of Balitar, the following can be concluded: 1.) By using a combination of SMART and TOPSIS, the system has been tested and has run according to its function. It was ranked with the results of 45 students entitled to KIP-K assistance, which should be 48 students compared to the calculation of the Unisba KIP-K team, 2.) The confusion matrix shows that the resulting recommendation system has an accuracy rate of around 94.92%, precision of around 93.75%, recall of around 93.75%, and F1-score of 93.75, which is included in the excellent classification. This proves that combining methods can provide results based on the selection needs of KIP-K recipients at the Islamic University of Balitar. Based on the conclusions that have been presented, several suggestions can be considered for the research and implementation of the KIP-K recipient selection decision support system in the future: 1.) The system that has been developed should continue to be improved and developed. The use of other, more sophisticated methods or combinations of other methods can be explored to improve the performance and accuracy of the system. 2.) Further research is recommended to evaluate the impact of implementing this system on the academic success of KIP-K recipients. This is important to ensure that the assistance provided has a positive impact. 3.) To maintain the election results' accuracy and relevance, the system's data must be updated regularly.

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