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SAW Method in Decision Making for Scholarship Recipients Faculty of Computer Science Indonesian Christian University Maluku

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ABSTRACT

The process of selecting scholarship recipients in academic institutions necessitates a meticulous and unbiased approach to ensure the fair distribution of educational resources. This study employs the Simple Additive Weighting (SAW) method to enhance decision-making in the Faculty of Computer Science at the Indonesian Christian University, Maluku. The SAW method provides a structured framework for evaluating scholarship candidates based on multiple criteria, including academic performance, extracurricular activities, and financial need. Through criteria normalization, weight assignment, and score calculation, the SAW method facilitates an objective ranking of candidates, allowing for a transparent and systematic decision-making process. The research aims to improve the efficiency and fairness of scholarship allocation, contributing to the advancement of educational opportunities for deserving individuals within the Faculty of Computer Science

INTRODUCTION

Technology is currently very important for the continuity of community activities wherever they exist due to the rapid development of science and technology which of course has an impact on all sectors ranging from politics, government, trade, to education[1]. Educational institutions, especially universities, in carrying out their services are seen to have used technology to support speed, accuracy and competitiveness which of course can produce output in the form of graduates and quality education that has value and quality[2].

Indonesian Christian University Maluku, the use of technology is clearly demonstrated in the products implemented, for example on the university website, websites for each faculty, websites for other campus facilities such as libraries. However, it is realized that there is still minimal implementation of technology in the education environment at the Indonesian Christian University, Maluku, one of which is in the implementation process for selecting students to receive scholarships. Scholarships themselves are a form of award in the form of financial assistance. Law Number 20 of 2003 concerning the National Education System, Chapter V article 12 (1.c), states that every student in every educational unit has the right to receive a scholarship for outstanding achievers whose parents cannot afford to pay for their education[2].

The use of methods that still have a conventional concept in their application is considered not optimal, giving rise to several problems that hinder the process of continuing academic regulations and cannot create momentum for implementing a transparent academic system. Therefore, in this research, the SAW method as a decision support system development method will be applied to solve the previously intended problem[3][4]. The title of the research being developed is Simple Additive Weighting Method in Supporting Scholarship Recipient Decision Making (Case Study of the Faculty of Computer Science, Indonesian Christian University, Maluku).

METHODS

The research approach used is a qualitative approach, namely an approach that uses descriptive data in the form of written or spoken language from people and actors who can be observed. This approach was carried out in research to explain and analyze phenomena that occurred at the Faculty of Computer Science, Indonesian Christian University, Maluku, which aims to get a comprehensive picture, in other words, holistically from the subject's point of view, without having to prove anything. Therefore, it is hoped that this research process can provide a good understanding and research approach, which directly refers to the research object being studied[5].

The population in this study were all students from the Faculty of Computer Science, Indonesian Christian University, Maluku. The sample in this study consisted of four samples. The first sample was taken from student data from the class of 2019, the second sample was taken from data from students from the class of 2020, the third sample was taken from data from students from the class of 2021, and the fourth sample was taken from data from students from the class of 2022. The data analysis technique used in this research is the numerical data analysis technique, where this technique concentrates on the quantity of data and does not require an explanation for each short answer given by the respondent.

SAW is an SPK method for finding the most ideal alternative based on previously determined criteria. The SAW method is often used to solve problems that require decision-making, because of the ability to make precise assessments based on predetermined criteria values and preference weights[6][7].

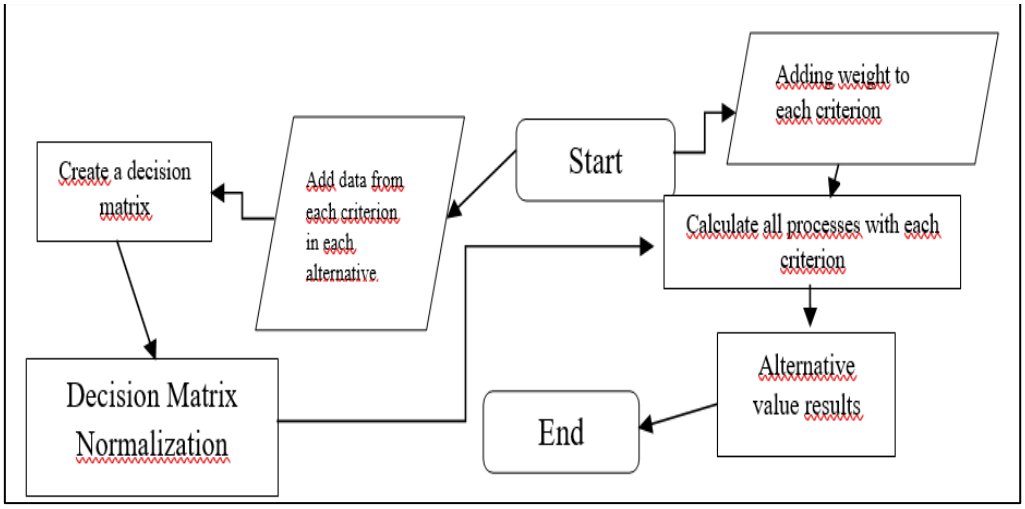

Figure 1. Flowchart SAW Method

The SAW algorithm in Figure 1 starts with two branching activities, namely adding data from each criterion to the alternative, and also adding weights to each criterion. The next stage is carried out by creating a decision matrix, followed by normalizing the decision matrix, then calculating all processes with each criterion based on the results of the matrix normalization and the weight of each criterion that has been entered previously. Finally, the results of the value of the alternatives offered can be seen and this concludes the flowchart diagram[8].

The formulas used in the SAW method can be explained as follows:

$$\boldsymbol{Rij} = \frac{\mathbf{Xij}}{\mathbf{Max\ Xij}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

*if j is the profit attribute (benefit)**

$$\boldsymbol{Rij} = \frac{\mathbf{Min\ Xij}}{\mathbf{Xij}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

*if j is the cost attribute**

Information :

Rij = normalized performance rating value
Xij = attribute value for each criterion
Max xij = largest value of each criterion i
Min xij = smallest value of each criterion i
Benefit = if the greatest value is the best
Cost = if the smallest value is the best where rij is the normalized performance rating of alternative Ai on attributes Cj, i=1,2,….,m and j=1,2,…,n.

The formula above is used to normalize the decision matrix (x) to a scale compared to all alternative comments. Next, the preference value for each alternative (Vi) is shown by the formula:

$$\mathbf{Vi} = \sum_{j=1}^{n} (\boldsymbol{Wj\ Rij}) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Information :

Vi = Rating for each alternative
Wj = Weight value of each criterion
Rij = Normalized performance rating value.

RESULTS AND DISCUSSION

The SAW method is applied starting from descriptive statistics related to research data including descriptions of respondents, research variables, data quality tests, data normality tests and classical assumptions. Where the test results are in the form of a hypothesis and a discussion of the hypothesis which is tested statistically using a data processing program, namely Ms. Excel.

1. Needs Analysis
   This writing has system requirements, namely: Requires a technology-based decision support system that can facilitate and realize educational interests structurally and academically at the Indonesian Christian University Maluku educational institution, especially at the Faculty of Computer Science.
2. Research Descriptive Data
   The data for this research comes from primary data in the form of a questionnaire submitted to students who willingly filled out the questionnaire in question, at the

Faculty of Computer Science, Indonesian Christian University, Maluku.

Table 2. Class Group

No	Class Of	number of students
1	Class of 2019	4
2	Class of 2020	48
3	Class of 2021	10
4	Class of 2022	11
Total		73

Of the 73 questionnaires filled out, all were filled out in Google form and of course in this case they can be presented as in the chart below:

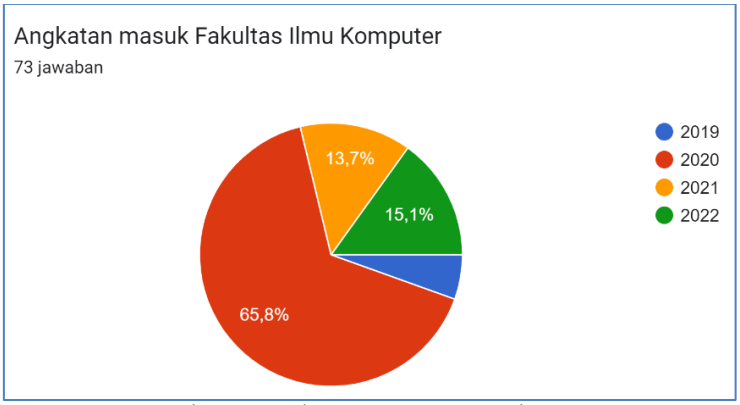

Figure 2. Class Group Comparison

From the graph above, the explanation can be explained as follows :

1. Respondent Demography
   The demographics of respondents in this study are gender, age, location of residence, and class which differentiate each data sample object. Where the majority of typical respondents are students from the Class of 2020, with a percentage reaching 65%, followed by the Class of 2022 with a representation of 15.1%, and then below that is the Class of 2021 with a percentage of 13.7%. And the lowest is the Class of 2019 with a percentage of 5.5%.
2. Descriptive statistics
   This research uses 7 built-in indicators by reality and analysis in a sample location. These 7 indicators give a strong character to the data set to be represented.

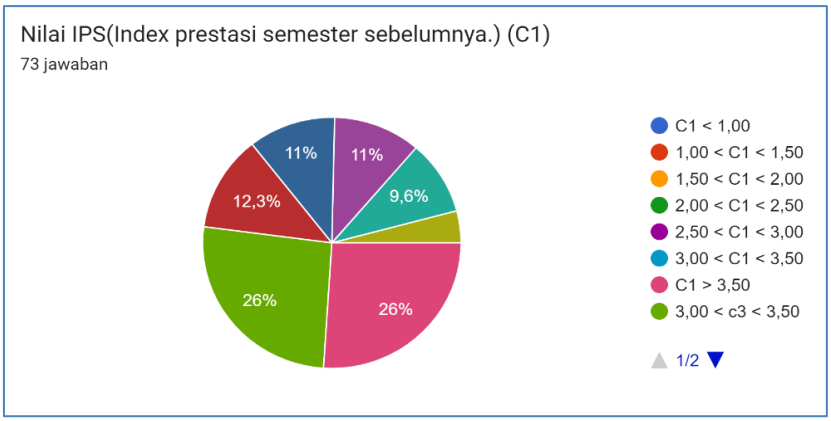

Figure 3. Indicator C1

This first indicator contains the percentage distribution of the average student's semester grades in the previous semester. As many as 26% were included in the group of students who obtained semester grades in the range of 3.00 < c3 < 3.50, and another 26% were included in the group of students who obtained semester grades above 3.50. 12.3% for the group of students who obtained semester grades in the range of 1.00 < C1 < 1.50. Another 11% for the group of students who obtained 2.00 < C1 < 2.50 and 2.50 < C1 < 3.00. Another 9% for the group of students with 1.00 < C3 < 1.50 while 4.1% for the group of students with semester grades C3 < 1.00.

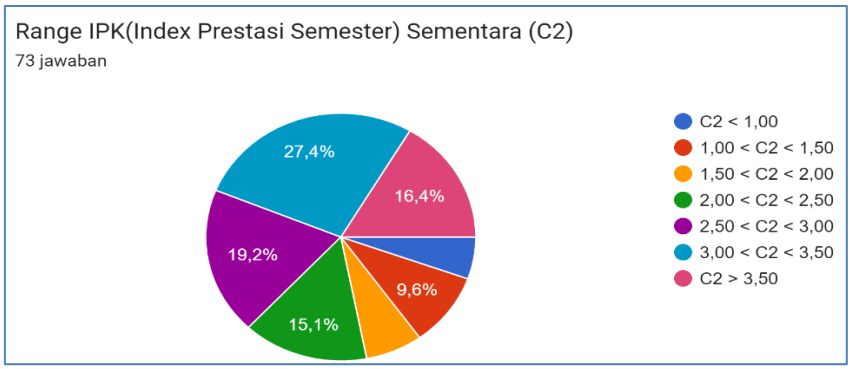

Figure 4. Indicator C2

The chart above contains the temporary GPA of the students, where the student data set shows a polarized distribution of good magnitude indices, with the largest being students who get a provisional GPA of 3.00<c2<3.50. Followed by a description of other data.

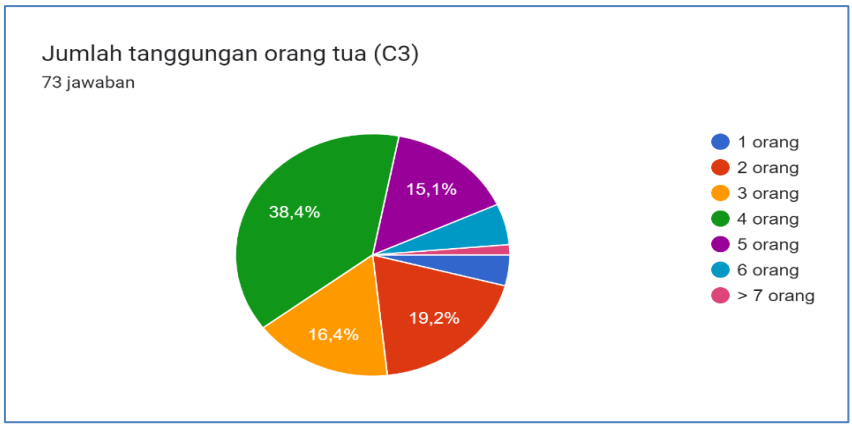

Figure 5. Indicator C3

For the diagram above, it contains the number of dependent parents, where the largest number is 4 people with a representation of 38.4%. And the fewest are more than 7 people, namely 1.4%.

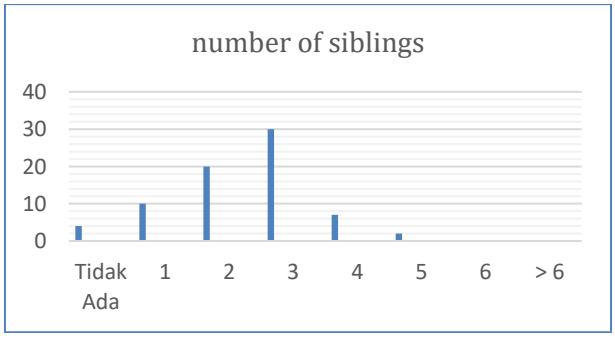

Figure 6. Indicator C4

In this chart, the indicator contains the number of siblings with the highest level being 2 siblings, with 30 respondents, while the lowest is 4 siblings with 2 respondents.

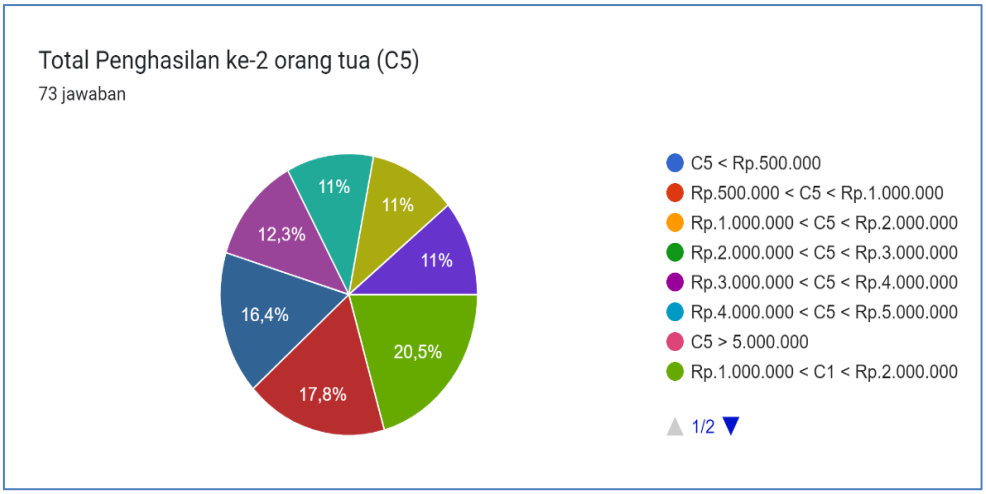

Figure 7. Indicator C5

With the highest granularity being 20.5% to cover 1000000<c1<2000000. Meanwhile, the lowest for each of the 3 categories with a percentage of 11%, namely the range of 2000000-3000000, then less than 500,000 and more than 5,000,000.

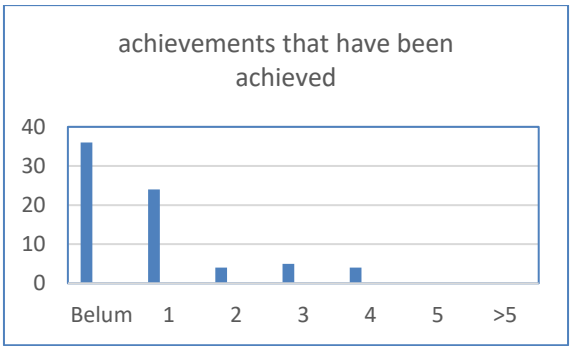

Figure 8. Indicator C6

The achievements that have been achieved show that UKIM Faculty of Informatics students are in the index of 36 students who do not have achievements, the rest have achievements.

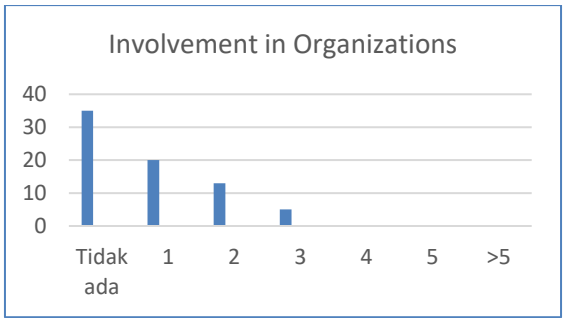

Figure 9. Indicator C7

In the chart above, student involvement in an organization is shown. Where on average the organizations that students participate in are within the university environment in this case, such as the Senate and UKM within the university environment. From the table above, there are 73 sample data, which have been taken from respondents, in which calculations and data balance are carried out in the calculation stages. Data tabulation is from the process of distributing questionnaire forms (Google Form), with the number of respondents ready to fill out the form being 73 respondents. Data tabulation is needed so that when entering the data analysis process, the data collected can be easily analyzed, thereby reducing data confusion, besides that, it also provides absolute value for data neutrality.

Based on the results of testing the hypothesis, it show that there is an influence of 7 indicators on determining whether a student will receive a scholarship. At the computer science faculty at the Indonesian Christian University, Maluku, from the results obtained, it is necessary to treat and update the decision-making process for scholarship acceptance.

The indicators used are C1 = the student's most recent semester score, C2 = the student's current cumulative achievement index, C3 = the number of dependents of the parents, C4 = the number of siblings, C5 = the total income of the parents, C6 = the achievements the student has achieved, and C7 = Student Organization. Of the five criteria that have been created, each is given a weight of C1 = 15, C2 = 15, C3 = 15, C4 = 10, C5 = 15, C6 = 20, and C7 = 10.

From the 7 indicators above, it is necessary to determine the weighting of the indicators, after previously weighting each indicator has been carried out according to the percentage that has been developed. The following variables and weights are presented in table form: Using Fuzzy MADM (Multiple Attribute Decision Making). With the n/n-1 variable formula.

Table 3. Alternative Equation Results

9,9	1,9	3,5	8,6	2,6	8,1	7
0,101010101	0,315789474	0,171428571	0,046511628	0,384615385	0,012345679	0,057142857
0,080808081	0,421052632	0,171428571	0,011627907	0,153846154	0,012345679	0,057142857
0,060606061	0,315789474	0,228571429	0,069767442	0,307692308	0,098765432	0,114285714
0,060606061	0,315789474	0,114285714	0,069767442	0,192307692	0,098765432	0,057142857
0,060606061	0,315789474	0,142857143	0,069767442	0,230769231	0,098765432	0,057142857
0,060606061	0,315789474	0,028571429	0,069767442	0,307692308	0,098765432	0,071428571
0,060606061	0,315789474	0,028571429	0,11627907	0,307692308	0,049382716	0,142857143
0,060606061	0,315789474	0,028571429	0,069767442	0,230769231	0,049382716	0,071428571
0,060606061	0,315789474	0,028571429	0,11627907	0,230769231	0,098765432	0,071428571
0,060606061	0,315789474	0,028571429	0,11627907	0,230769231	0,074074074	0,014285714
0,060606061	0,315789474	0,028571429	0,11627907	0,230769231	0,074074074	0,014285714
0,060606061	0,315789474	0,028571429	0,093023256	0,230769231	0,074074074	0,014285714
0,060606061	0,315789474	0,028571429	0,093023256	0,230769231	0,074074074	0,014285714
0,101010101	0,526315789	0,171428571	0,093023256	0,384615385	0,12345679	0,085714286
0,060606061	0,315789474	0,228571429	0,093023256	0,230769231	0,074074074	0,114285714
0,101010101	0,526315789	0,228571429	0,046511628	0,038461538	0,012345679	0,114285714
0,101010101	0,526315789	0,228571429	0,046511628	0,384615385	0,061728395	0,114285714
0,101010101	0,526315789	0,228571429	0,093023256	0,230769231	0,12345679	0,114285714
0,080808081	0,421052632	0,228571429	0,093023256	0,307692308	0,098765432	0,114285714
0,080808081	0,421052632	0,228571429	0,093023256	0,307692308	0,049382716	0,114285714
0,080808081	0,421052632	0,228571429	0,093023256	0,307692308	0,098765432	0,028571429
0,080808081	0,421052632	0,228571429	0,046511628	0,076923077	0,049382716	0,114285714
0,01010101	0,052631579	0,171428571	0,093023256	0,307692308	0,074074074	0,085714286
0,02020202	0,105263158	0,171428571	0,069767442	0,153846154	0,074074074	0,085714286
0,04040404	0,210526316	0,171428571	0,069767442	0,230769231	0,074074074	0,085714286
0,080808081	0,421052632	0,171428571	0,069767442	0,192307692	0,074074074	0,085714286
0,02020202	0,105263158	0,171428571	0,069767442	0,307692308	0,098765432	0,057142857
0,01010101	0,052631579	0,171428571	0,069767442	0,230769231	0,074074074	0,057142857
0,04040404	0,210526316	0,171428571	0,069767442	0,153846154	0,074074074	0,028571429
0,080808081	0,421052632	0,171428571	0,069767442	0,192307692	0,061728395	0,114285714
0,060606061	0,315789474	0,171428571	0,069767442	0,153846154	0,049382716	0,114285714
0,02020202	0,105263158	0,171428571	0,023255814	0,038461538	0,012345679	0,114285714
0,050505051	0,263157895	0,171428571	0,069767442	0,192307692	0,061728395	0,114285714
0,080808081	0,421052632	0,171428571	0,058139535	0,307692308	0,098765432	0,114285714
0,080808081	0,421052632	0,057142857	0,023255814	0,153846154	0,049382716	0,114285714
0,02020202	0,105263158	0,057142857	0,046511628	0,153846154	0,049382716	0,014285714
0,080808081	0,421052632	0,028571429	0,093023256	0,230769231	0,074074074	0,014285714
0,080808081	0,421052632	0,057142857	0,011627907	0,192307692	0,049382716	0,085714286
0,080808081	0,421052632	0,057142857	0,011627907	0,230769231	0,074074074	0,071428571
0,01010101	0,052631579	0,028571429	0,023255814	0,076923077	0,012345679	0,057142857
0,080808081	0,421052632	0,057142857	0,093023256	0,076923077	0,049382716	0,028571429
0,050505051	0,263157895	0,171428571	0,023255814	0,038461538	0,061728395	0,114285714
0,060606061	0,315789474	0,228571429	0,046511628	0,153846154	0,049382716	0,114285714
0,04040404	0,210526316	0,228571429	0,046511628	0,153846154	0,049382716	0,057142857
0,080808081	0,421052632	0,114285714	0,046511628	0,153846154	0,024691358	0,114285714
0,01010101	0,052631579	0,114285714	0,058139535	0,307692308	0,049382716	0,057142857
0,060606061	0,315789474	0,114285714	0,058139535	0,076923077	0,012345679	0,057142857
0,050505051	0,263157895	0,228571429	0,046511628	0,076923077	0,024691358	0,085714286
0,04040404	0,210526316	0,057142857	0,046511628	0,153846154	0,049382716	0,085714286
0,01010101	0,052631579	0,114285714	0,011627907	0,038461538	0,024691358	0,085714286
0,050505051	0,263157895	0,142857143	0,011627907	0,307692308	0,061728395	0,028571429
0,080808081	0,421052632	0,114285714	0,058139535	0,307692308	0,098765432	0,114285714
0,04040404	0,210526316	0,028571429	0,093023256	0,038461538	0,012345679	0,014285714
0,04040404	0,210526316	0,028571429	0,046511628	0,307692308	0,098765432	0,114285714
0,050505051	0,263157895	0,114285714	0,046511628	0,076923077	0,061728395	0,114285714
0,01010101	0,052631579	0,028571429	0,023255814	0,038461538	0,074074074	0,114285714
0,01010101	0,052631579	0,028571429	0,046511628	0,307692308	0,012345679	0,114285714
0,080808081	0,421052632	0,028571429	0,011627907	0,307692308	0,098765432	0,057142857
0,060606061	0,315789474	0,028571429	0,011627907	0,230769231	0,074074074	0,057142857
0,080808081	0,421052632	0,028571429	0,011627907	0,230769231	0,074074074	0,114285714
0,080808081	0,421052632	0,028571429	0,011627907	0,192307692	0,061728395	0,114285714
0,101010101	0,526315789	0,028571429	0,011627907	0,153846154	0,049382716	0,114285714
0,101010101	0,526315789	0,028571429	0,011627907	0,038461538	0,012345679	0,114285714
0,080808081	0,421052632	0,028571429	0,011627907	0,192307692	0,061728395	0,114285714
0,101010101	0,526315789	0,028571429	0,11627907	0,384615385	0,12345679	0,085714286
0,101010101	0,526315789	0,028571429	0,11627907	0,307692308	0,098765432	0,085714286
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0,050505051	0,263157895	0,228571429	0,069767442	0,307692308	0,098765432	0,142857143
0,01010101	0,052631579	0,228571429	0,093023256	0,384615385	0,12345679	0,142857143

The table above shows the results of the alternative equation operation (Ai), where the value of A1 is divided by the product of the value of A1 to the value of A73. with details :

Alternative A1 :

R11 = 1/9.9 = 0,10

R12 = 1/1.9 = 0,31

R13 = 0.6/3.5 = 0,17

R14 = 0.4/8.6 = 0,046

R15 = 1/ 2.6 = 0,384

R16 = 0.1/8.1 = 0,012

R17 = 0.4/7 = 0,057.

Then the next step is to carry out the same calculations for Alternatives A2 to A73. By using Excel, the results that can be taken are as follows

Table 4. R Normalization Results

15	15	15	10	15	20	10	Hasil Akhir
1,515151515	4,736842105	2,571429	0,465116	5,769231	0,24691358	0,571429	15,87611139
1,212121212	6,315789474	2,571429	0,116279	2,307692	0,24691358	0,571429	13,34165279
0,909090909	4,736842105	3,428571	0,697674	4,615385	1,975308642	1,142857	17,50572926
0,909090909	4,736842105	1,714286	0,697674	2,884615	1,975308642	0,571429	13,48924575
0,909090909	4,736842105	2,142857	0,697674	3,461538	1,975308642	0,571429	14,49474025
0,909090909	4,736842105	0,428571	0,697674	4,615385	1,975308642	0,714286	14,07715783
0,055096419	4,736842105	0,428571	1,162791	4,615385	0,987654321	1,428571	13,41491102
0,909090909	4,736842105	0,428571	0,697674	3,461538	0,987654321	0,714286	11,93565736
0,909090909	4,736842105	0,428571	1,162791	3,461538	1,975308642	0,714286	13,38842796
0,909090909	4,736842105	0,428571	1,162791	3,461538	1,481481481	0,142857	12,32317223
0,909090909	4,736842105	0,428571	1,162791	3,461538	1,481481481	0,142857	12,32317223
0,909090909	4,736842105	0,428571	0,930233	3,461538	1,481481481	0,142857	12,09061409
0,909090909	4,736842105	0,428571	0,930233	3,461538	1,481481481	0,142857	12,09061409
1,515151515	7,894736842	2,571429	0,930233	5,769231	2,469135802	0,857143	22,00705892
0,909090909	4,736842105	3,428571	0,930233	3,461538	1,481481481	1,142857	16,09061409
1,515151515	7,894736842	3,428571	0,465116	0,576923	0,24691358	1,142857	15,27026986
1,515151515	7,894736842	3,428571	0,465116	5,769231	1,234567901	1,142857	21,45023188
1,515151515	7,894736842	3,428571	0,930233	3,461538	2,469135802	1,142857	20,84222375
1,212121212	6,315789474	3,428571	0,930233	4,615385	1,975308642	1,142857	19,62026507
1,212121212	6,315789474	3,428571	0,930233	4,615385	0,987654321	1,142857	18,63261075
1,212121212	6,315789474	3,428571	0,930233	4,615385	1,975308642	0,285714	18,76312222
1,212121212	6,315789474	3,428571	0,465116	1,153846	0,987654321	1,142857	14,70595601
0,151515152	0,789473684	2,571429	0,930233	4,615385	1,481481481	0,857143	11,39665892
0,303030303	1,578947368	2,571429	0,697674	2,307692	1,481481481	0,857143	9,797397308
0,606060606	3,157894737	2,571429	0,697674	3,461538	1,481481481	0,857143	12,83322113
1,212121212	6,315789474	2,571429	0,697674	2,884615	1,481481481	0,857143	16,0202534
0,303030303	1,578947368	2,571429	0,697674	4,615385	1,975308642	0,571429	12,31320249
0,151515152	0,789473684	2,571429	0,697674	3,461538	1,481481481	0,571429	9,72454034
0,606060606	3,157894737	2,571429	0,697674	2,307692	1,481481481	0,285714	11,10794641
1,212121212	6,315789474	2,571429	0,697674	2,884615	1,234567901	1,142857	16,0590541
0,909090909	4,736842105	2,571429	0,697674	2,307692	0,987654321	1,142857	13,35323978
0,303030303	1,578947368	2,571429	0,232558	0,576923	0,24691358	1,142857	6,652658182
0,757575758	3,947368421	2,571429	0,697674	2,884615	1,234567901	1,142857	13,2360876
1,212121212	6,315789474	2,571429	0,581395	4,615385	1,975308642	1,142857	18,41428501
1,212121212	6,315789474	0,857143	0,232558	2,307692	0,987654321	1,142857	13,05581545
0,303030303	1,578947368	0,857143	0,465116	2,307692	0,987654321	0,142857	6,642440579
1,212121212	6,315789474	0,428571	0,930233	3,461538	1,481481481	0,142857	13,97259176
1,212121212	6,315789474	0,857143	0,116279	2,884615	0,987654321	0,857143	13,23074518
1,212121212	6,315789474	0,857143	0,116279	3,461538	1,481481481	0,714286	14,15863827
0,151515152	0,789473684	0,428571	0,232558	1,153846	0,24691358	0,571429	3,574306709
1,212121212	6,315789474	0,857143	0,930233	1,153846	0,987654321	0,285714	11,74250086
0,757575758	3,947368421	2,571429	0,232558	0,576923	1,234567901	1,142857	10,46327901
0,909090909	4,736842105	3,428571	0,465116	2,307692	0,987654321	1,142857	13,97782449
0,606060606	3,157894737	3,428571	0,465116	2,307692	0,987654321	0,571429	11,52441825
1,212121212	6,315789474	1,714286	0,465116	2,307692	0,49382716	1,142857	13,65168929
0,151515152	0,789473684	1,714286	0,581395	4,615385	0,987654321	0,571429	9,411137407
0,909090909	4,736842105	1,714286	0,581395	1,153846	0,24691358	0,571429	9,913802383
0,757575758	3,947368421	3,428571	0,465116	1,153846	0,49382716	0,857143	11,10344806
0,606060606	3,157894737	0,857143	0,465116	2,307692	0,987654321	0,857143	9,238703965
0,151515152	0,789473684	1,714286	0,116279	0,576923	0,49382716	0,857143	4,699446714
0,757575758	3,947368421	2,142857	0,116279	4,615385	1,234567901	0,285714	13,09974719
1,212121212	6,315789474	1,714286	0,581395	4,615385	1,975308642	1,142857	17,55714215
0,606060606	3,157894737	0,428571	0,930233	0,576923	0,24691358	0,142857	6,08945313
0,606060606	3,157894737	0,428571	0,465116	4,615385	1,975308642	1,142857	12,39119345
0,757575758	3,947368421	1,714286	0,465116	1,153846	1,234567901	1,142857	10,41561737
0,151515152	0,789473684	0,428571	0,232558	0,576923	1,481481481	1,142857	4,803380105
0,151515152	0,789473684	0,428571	0,465116	4,615385	0,24691358	1,142857	7,839831882
1,212121212	6,315789474	0,428571	0,116279	4,615385	1,975308642	0,571429	15,23488301
0,909090909	4,736842105	0,428571	0,116279	3,461538	1,481481481	0,571429	11,70523203
1,212121212	6,315789474	0,428571	0,116279	3,461538	1,481481481	1,142857	14,15863827
1,212121212	6,315789474	0,428571	0,116279	2,884615	1,234567901	1,142857	13,33480161
1,515151515	7,894736842	0,428571	0,116279	2,307692	0,987654321	1,142857	14,39294263
1,515151515	7,894736842	0,428571	0,116279	0,576923	0,24691358	1,142857	11,92143266
1,212121212	6,315789474	0,428571	0,116279	2,884615	1,234567901	1,142857	13,33480161
1,515151515	7,894736842	0,012245	1,162791	5,769231	2,469135802	0,857143	19,68043338
1,515151515	7,894736842	0,428571	1,162791	4,615385	1,975308642	0,857143	18,4490866
1,212121212	6,315789474	0,857143	0,232558	0,576923	0,49382716	0,857143	10,54550478
0,151515152	0,789473684	0,428571	1,162791	3,461538	1,481481481	0,857143	8,332513762
1,515151515	7,894736842	0,428571	0,581395	0,576923	0,987654321	0,857143	12,84157539
1,212121212	6,315789474	0,428571	0,116279	0,576923	0,24691358	0,857143	9,753740698
1,515151515	7,894736842	4,285714	0,930233	4,615385	1,975308642	0,857143	22,07367132
0,757575758	3,947368421	3,428571	0,697674	4,615385	1,975308642	1,428571	16,85045471
0,151515152	0,789473684	3,428571	0,930233	5,769231	2,469135802	1,428571	14,96673082

The table above is a normalization table for R. using vector weights that have been previously determined in the Vi formula, to determine the final result of determining scholarship acceptance. In the table above you can determine which students are entitled to receive scholarships held at the Faculty of Computer Science, Indonesian Christian University Maluku.

Table 5. Data on Students who are Entitled to Receive Scholarships

No	Nama	Nilai
1	A71	22,07367
2	A14	22,00706
3	A17	21,45023
4	A18	20,84222
5	A65	19,68043
6	A19	19,62027
7	A21	18,76312
8	A20	18,63261
9	A66	18,44909
10	A34	18,41429
11	A52	17,55714
12	A3	17,50573
13	A72	16,85045
14	A15	16,09061
15	**A30**	16,05905
16	A26	16,02025
17	A1	15,87611
18	A24	15,44333
19	A16	15,27027
20	A58	15,23488
21	A69	15,14927
22	A73	14,96673
23	A22	14,70596
24	A5	14,49474
25	A62	14,39294

In the table above, 25 students are collected who are entitled to scholarships from a total of 73 students. These 25 students are entitled to receive scholarships according to the assessment indicator components entered previously. With the final weighting value above the average value, namely >= 14.29. So what is obtained is that the highest weighting goes to the student with the code name A71 with a weight value of 22.07367 and ends with student number 25 who meets the standards with the code name A62 has a value of 14.39294.

CONCLUSION

In conclusion, the application of the Simple Additive Weighting (SAW) method in the scholarship selection process for the Faculty of Computer Science at the Indonesian Christian University, Maluku, has yielded recommendations for 25 deserving students. Utilizing Microsoft Excel as a data processing tool and setting a passing grade criterion of >= 4.29, the SAW method provided a systematic approach to decision-making. The study emphasizes the importance of continuous improvement, suggesting that while the research has concluded, there are opportunities for further development. The findings can serve as a valuable reference for the faculty, aiding in the enhancement of processes and regulations, minimizing errors, fraud, and contributing to the overall efficiency of

scholarship allocation. Additionally, the study encourages future research to explore implementation into application products and comparative testing of various methods for improved decision-making accuracy.

REFERENCES

A. Ramadhanu And R. H. Arsyah, "Pengembangan Website Dan Metode Saw Untuk Rekomendasi Wisata Alam Sumatra Barat," Indones. J. Comput. Sci., Vol. 10, No. 1, 2021.

H. Taherdoost, "Analysis Of Simple Additive Weighting Method (Saw) As A Multiattribute Decision-Making Technique: A Step-By-Step Guide," J. Manag. Sci. Eng. Res., Vol. 6, No. 1, Pp. 21–24, 2023, Doi: 10.30564/Jmser.V6i1.5400.

M. Z. Katili, L. N. Amali, And M. S. Tuloli, "Impelementasi Metode Ahp-Topsis Dalam Sistem Pendukung Rekomendasi Mahasiswa Berprestasi Abstrak," Jambura J. Informatics, No. August, 2021, Doi: 10.37905/Jji.V3i1.10246.

P. A. Sasmito, Ilhamsyah, And R. P. Sari, "Sistem Pendukung Keputusan Penerima Beasiswa Dengan Menerapkan Mesasmito, P. A., Ilhamsyah, & Sari, R. P. (2019). Sistem Pendukung Keputusan Penerima Beasiswa Dengan Menerapkan Metode Simple Additive Weighting (Saw).," Coding J. Komput. Dan Apl., Vol. 07, No. 01, Pp. 43–53, 2019, [Online]. Available: Https://Jurnal.Untan.Ac.Id/Index.Php/Jcskommipa/Article/View/30832

Presiden Republik Indonesia, "Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional," Vol. 4. 2003. [Online]. Available: Https://Pusdiklat.Perpusnas.Go.Id/Regulasi/Download/6

P. Perumahan And D. Kota, "Jurnal Sains Dan Informatika," Vol. 08, No. 01, Pp. 41–47, 2022.

T. Wulandari, "Syarat Beasiswa Indonesia Maju S1 Dalam Negeri, Daftar Yuk!," *Detikedu*, 2022. Https://Www.Detik.Com/Edu/Beasiswa/D-6070976/Syarat-Beasiswa-Indonesia-Maju-S1-Dalam-Negeri-Daftar-Yuk

Y. Febrian Sabanise And A. Rakhman, "Sistem Pendukung Keputusan Penerimaan Beasiswa Dengan Menggunakan Metode Simple Additive Weighting (Saw) Studi Kasus Politeknik Harapan Bersama Tegal," *Smart Comp Jurnalnya Orang Pint. Komput.*, Vol. 8, No. 1, Pp. 48–53, 2019, Doi: 10.30591/Smartcomp.V8i1.1318.