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Implementation of Decision Support System for Scholarship Recipients at Bank Indonesia

Dian Megah Sari[1], Nurhikma Arifin[2], Nurfitrianingsih[3], Andi M Yusuf[4*]

[1-3]*Department of Informatics, Universitas Sulawesi Barat, Majene, Indonesia*
[4]*Department of Informatics, Universitas Teknologi Akba Makassar, Makassar, Indonesia*

Abstract

The Bank Indonesia Scholarship is a social program by Bank Indonesia that provides tuition assistance for undergraduate students at various State Universities (PTN). However, the process of determining scholarship recipients has often been inaccurate, primarily because the selection process has not utilized systematic tools or methods. To address this issue, a system has been designed to enhance the accuracy of scholarship recipient selection. The selection process requires precision and is time-consuming, as each student's data must be compared according to predetermined criteria, making it susceptible to human error. Currently, Bank Indonesia has not implemented a method to facilitate the selection of potential scholarship recipients, relying instead on manual comparisons. This study introduces the application of the Fuzzy Multiple Attribute Decision Making (FMADM) method combined with Simple Additive Weighting (SAW) to improve the selection process. The FMADM method is employed to identify the best alternatives from a set of options based on predefined criteria, while the SAW method is used to rank these alternatives. The findings of this study serve as a decision-making tool to recommend scholarship recipients, contributing to the development of knowledge in the field of decision support systems. By integrating these methods, the research advances the accuracy and efficiency of scholarship selection processes, offering a model that can be adapted for similar contexts in educational funding and beyond.

Keywords: Algorithm; Scholarship; FMADM; SAW.

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Introduction

Bank Indonesia (BI) is one of the banks that has always played an active role in the development of education in Indonesia. One form of its realization is by issuing a scholarship program provided by Bank Indonesia (BI) (Moorena et al., 2020). The scholarship program provided by Bank Indonesia (BI) is a form of social responsibility that is shown to increase awareness for communities throughout Indonesia. This is as a means of increasing participation and the position of the organization in the community (von Allmen & Kang, 2018).

One form of Bank Indonesia's concern in the field of education is the provision of scholarships. Scholarships are given to a number of State Universities in all regions of Indonesia, one of which is the University of West Sulawesi which gets a quota for its students in each new academic year to participate in the Bank Indonesia scholarship program for underprivileged students and outstanding students (Nurdin et al., 2021). Based on an initial survey conducted by researchers at the University of West Sulawesi, the recipients of the University of West Sulawesi Scholarship consisted of several majors, namely Informatics Engineering, Management, Accounting, Mathematics Education, Law, Agribusiness, and International Relations.

In each year the number of applicants for Bank Indonesia Scholarships reaches 200-300 students, while Bank Indonesia only provides a quota of 50 scholarship recipients for students at the University of West Sulawesi, therefore scholarships should be given to students who deserve and deserve to get it in accordance with the requirements that have been given, but based on interviews conducted by researchers with several recipients of Bank Indonesia Scholarships, they stated that there were several scholarship recipients who they thought were not right on target (Kardashevskaya & others, 2021).

*Corresponding author.
E-mail address: andiyusuf@akba.ac.id (Andi M Yusuf)

The selection process for Bank Indonesia Scholarships requires accuracy and a long time because each student data will be compared one by one according to predetermined criteria and is also prone to accidental human errors. Meanwhile, Bank Indonesia has not determined a method to help select prospective scholarship recipients and the selection process is still being carried out manually by comparing the data of prospective scholarship recipients one by one (Yu, 2020). In determining who is really entitled to a scholarship, a good decision support system is needed to assist the selection team in the selection process for scholarship recipients based on specified criteria because the number of applicants for scholarship recipients is very large, a decision support system is needed to assist the selection process so that easier, faster, and reduce errors in determining scholarship recipients(Miller et al., 2018).

This research on decision support has been researched by (Mi et al., 2019) which finds that the algorithm is successfully implemented and functions well, then research conducted by (Duan et al., 2019) finds that the application of the algorithm in its application can determine the best results from the selection of boarding houses, and from the test results have received a response of 80.70% or a percentage above 80%, further research from (Marbun et al., 2021) found that the decision-making system implemented was very helpful in providing recommendations for PPA scholarship acceptance at DN universities, further research from (Hasan et al., 2019) got the results that the SAW method provided the best alternative in supporting the decision to accept scholarships at SMKN 1 Ciomas, and further research from (Wang et al., 2022) found that the algorithm applied could rank for selection. new student admissions.

Decision support systems are defined as systems based on computing that can help make decisions using data and models to solve certain problems. The method that will be used in this study for the decision-making system for determining scholarship recipients is the Fuzzy Multi-Attribute Decision Making method and the Simple Additive Weighting (SAW) method. used to find the optimal alternative from a number of alternatives with certain criteria.

Method

The research method used is Research and Development (R & D). This research method is a research method used to produce certain products and test the effectiveness of these methods, the product is not only in the form of objects or hardware (hardware). But it can also be in the form of software (software) (Serevina et al., 2018).

Research Stages

The description of the research stages is as follows:

1. Identifying the problem in question is that researchers carry out the first stage in conducting research, namely formulating the problem to be studied. This stage is the most important stage in research, because all the research will be guided by the formulation of the problem. Without a clear problem formulation, researchers will lose direction in conducting research.
2. This literature study aims to determine the methods and basic knowledge or references that support the development of a decision support system. Literature study includes 1) Decision Support Systems, and 2) the Fuzzy SAW method, useful literature is needed for understanding concepts and deepening theories about decision support systems using the Fuzzy SAW method from several sources of international journals, books, and the internet.
3. The data used comes from the data of prospective students who register according to the required criteria. Collecting data from the results of previous studies. However, if it is deemed necessary, data collection is carried out again from potential system users as a complement to the missing documents.
4. Analyze the data that has been collected to be processed using the Fuzzy Multiple Attribute Decision Making and Simple Additive Weighting method
5. System design is very important in building an information system because this process describes how a system is formed starting from the planning description to the stage of making functions that are useful for the course of an application.
6. Implementation of the system, system testing is carried out to determine the accuracy of the methods and systems used

System Flow

In general, the system that will be created is shown in Figure 1. The website-based system uses the PHP programming language by applying two methods, namely Fuzzy. And SAW The flow chart of the Bank Indonesia Scholarship Receipt system is as follows:

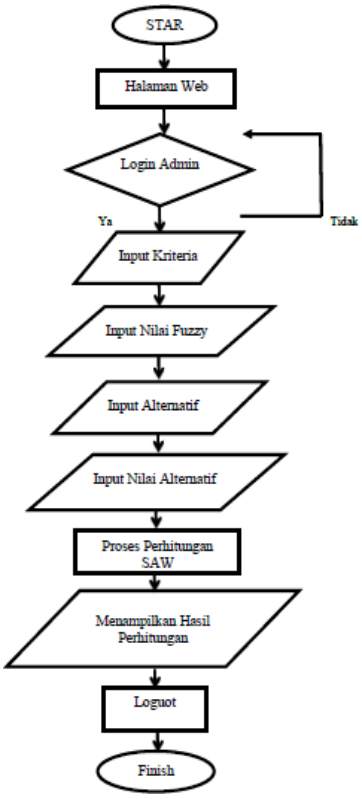


Figure 1. System Flow

The data to be used in this study is sourced from data obtained from the Bank Indonesia office and data on prospective scholarship recipients which will be processed in determining scholarship recipients. In addition, this study also requires supporting data sourced from books, journals, and other literature. that are relevant to this research are related to what features support the determination of scholarship recipients (Wachid & Yun\ita, n.d.).

System Test

The test was conducted to determine whether the Decision Support System for Bank Indonesia Scholarship Recipients was functioning properly in dealing with existing problems. Testing using testing techniques using black box testing. black box testing is used to test the functional input and output of the application.

Results and Discussion

Result

This study uses 2018-2019 data based on scholarship registrant data in that year. There are 10 parameters or attributes in determining prospective scholarship recipients which are shown in Table 1. The total data used is 200 data which is divided into 100 data for training data and 100 data for training data. data for testing data for the two methods used. There are two classes in this classification process, namely the feasible and the unfeasible classes. The eligible class is intended as the category of scholarship recipients, while the unqualified class is defined as those who did not receive a Bank Indonesia scholarship. The following criteria are shown in table 1, below:

Table 1. Criteria

No.	Name of criteria	Sub criteria
1.	Students who are active	Active Not Active
2.	Have completed a minimum of 40 credits	Achieved Did not achieve
3.	Have a minimum IPK of 3.00 (scale 4.0)	3.00 - 3.25 3.26 - 3.40 3.41 – 3.60 3.61 – 3.80 3.81 – 4.00
4	Maximum age 23 years old	18-23 years old 24-27 years old
5.	Not currently receiving another scholarship	Nor receiving Received another scholarship
6.	Coming from an economically disadvantaged family (pre-prosperous)	Have SKTM Do not have SKTM
7.	Make motivation letters	1 2 3 4 5
8.	Include a letter of recommendation from one figure (academic or non-academic)	Have Do not have
9.	Willing to play an active role in the New Generation of Indonesia and participate in activities carried out by Bank Indonesia	Have Do not have
10.	Have Interest and Experience	0 Certificate 1 Certificates 2-3Certificates 3-5 Certificates 6-20Certificates

Calculation Using Fuzzy Logic and Simple Additive Weighting (SAW)

There are several calculation steps that are used in this system to produce recommendations for majors in accordance with predetermined variables. Here are some calculation steps using fuzzy logic and simple additive weighting (SAW):

1. Specifies the variable to be used.
2. Determine the weight for each variable.
3. Perform calculations using fuzzy logic.
4. Specifies the linguistic value for each predefined variable.
5. Determine the categorization for the linguistic value of each variable.
6. Determine the membership function based on the categorization that will be used to calculate the degree of membership of each variable.
7. Enter the value of the variable to get the value of the degree of membership of each variable and then look for the max value of the degree of membership.
8. Perform defuzzification by finding the average value of the degree of membership in each variable that has been determined.
9. Perform calculations using SAW (simple additive weighting)
10. Normalize the variables that have been determined based on the equation that is adjusted to the type (profit attribute or cost attribute) so that normalization results are obtained.

Perform ranking, the addition of the multiplication between the weights with the results of normalization so that the largest value is chosen as the best alternative

Set of Match Ratings

The suitability rating set is a rating set consisting of linguistic variables for alternative assessments with decision criteria. Like the interest rating set, the match rating set also uses triangular fuzzy numbers in which each linguistic variable consists of 3 values, namely the lower limit, middle limit, and upper limit. The compatibility rating can be seen in Table 2.

Table 2. Match Rating

Linguistic Variables	Lower limit	Middle limit	Upper limit
Very less	0.1	0.1	0.25
Not enough	0.1	0.25	0.25
Enough	0.25	0.5	0.75
well	0.5	0.75	1
Very good	0.75	1	1

From the table above, the degree of fuzzy membership can be described as shown in Figure 2.

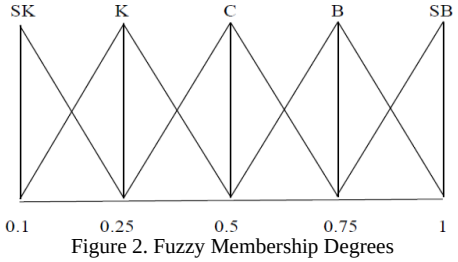


Figure 2. Fuzzy Membership Degrees

Discussion

Implementasi Sistem

System Implementation is the application of a decision support system (DSS) model for recommendations for determining the prospective recipients of Bank Indonesia Scholarships using the Fuzzy Saw Method (Aman et al., 2022).

Form Login

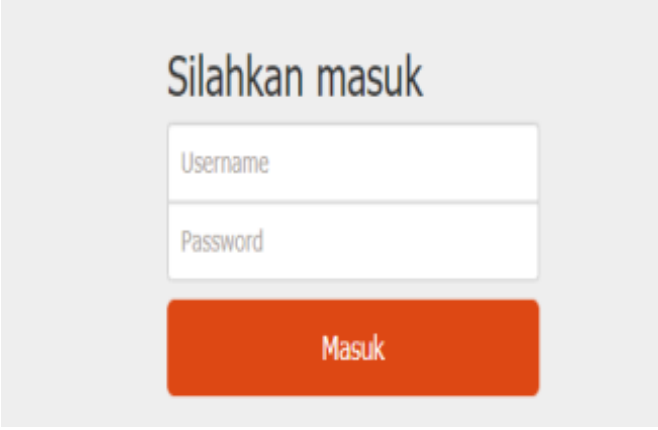


Figure 3. Display Login Form

Figure 3. above is the initial view when entering the system for admins. When the username is wrong or the password is wrong, the user will not be able to enter the system successfully

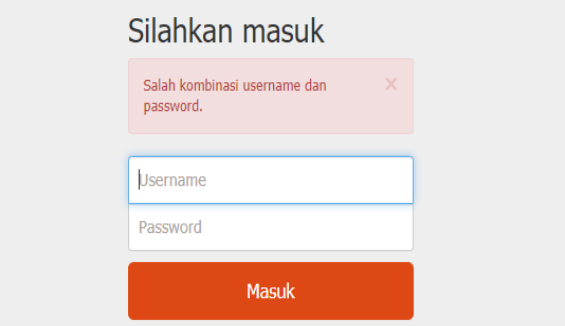


Figure 4. Display when Username and Password is Wrong

Home Menu Display

After the user successfully logs into the system, the first display that appears is the home menu as shown in figure5.

Figure 5. Home Menu Display

Criteria Page View

Figure 6 displays the criteria page

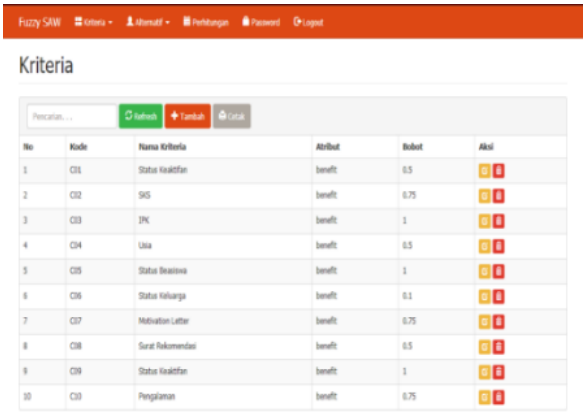


Figure 6. Criteria page

Scips Value Page View

The page displayed in Figure 7 is that the Script Value is where the admin will input the respective Membership Degree Value.

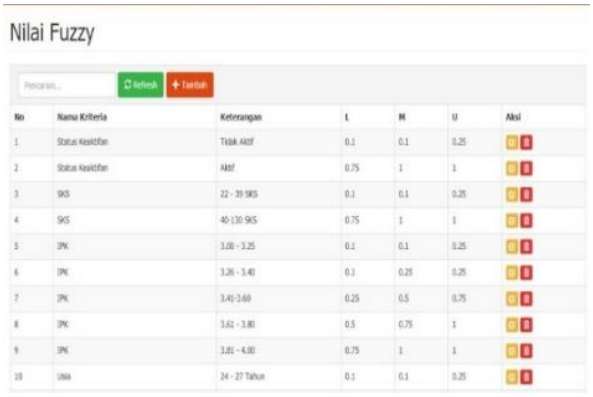


Figure 7. Fuzzy Values Page

Alternatives Page Views

The Alternative page in Figure 8. is where the admin will input the alternative name or in other words, the prospective recipient of the Bank Indonesia Scholarship.

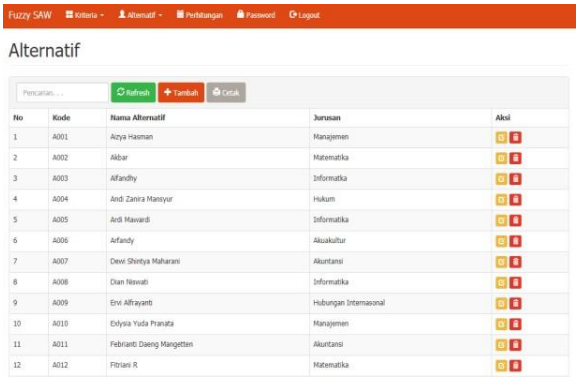


Figure 8. Alternative Page

The page display in Figure 9 serves to process the SAW calculation data to obtain alternative weight values.

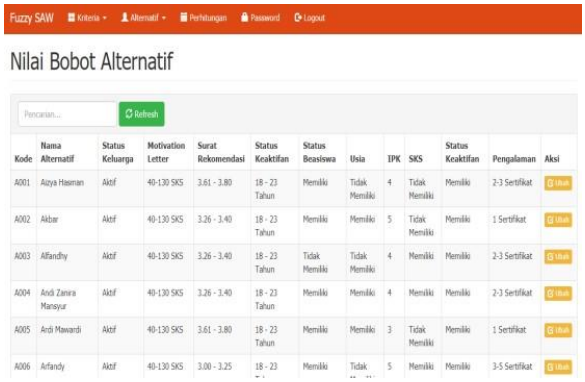
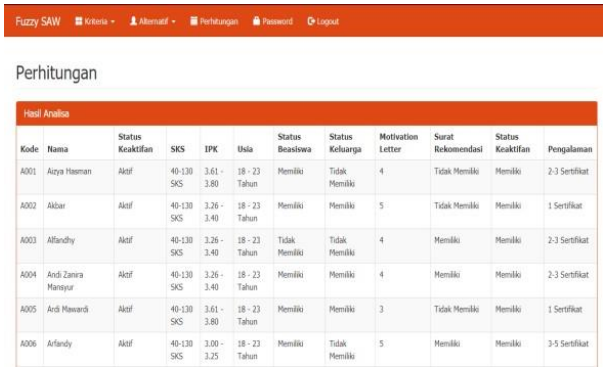


Figure 9. Alternate Weight Value Display

Page View Process Calculation of results and ranking

The page display of the result calculation process and ranking can be seen in Figures 10, 11, 12, 13,14 and 15 which serves to perform the process of Fuzzy SAW.



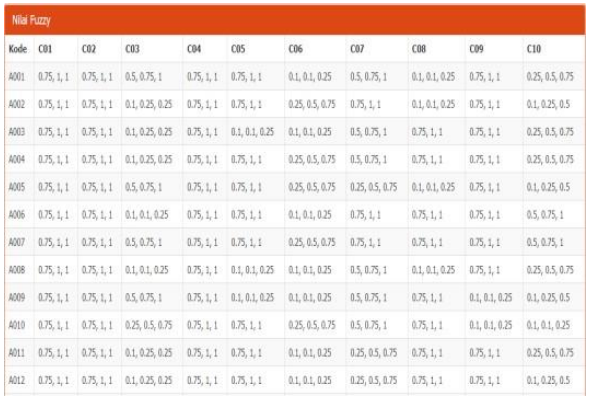
Fuzzy SAW | Kriteria | Alternatif | Perhitungan | Password | Logout

Perhitungan

Hasil Analisa

Kode	Nama	Status Keaktifan	SKS	IPK	Usia	Status Beasiswa	Status Keluarga	Motivation Letter	Surat Rekomendasi	Status Keaktifan	Pengalaman
A001	Aizya Hasman	Aktif	40-130 SKS	3.61 - 3.80	18 - 23 Tahun	Memiliki	Tidak Memiliki	4	Tidak Memiliki	Memiliki	2-3 Sertifikat
A002	Akbar	Aktif	40-130 SKS	3.26 - 3.40	18 - 23 Tahun	Memiliki	Memiliki	5	Tidak Memiliki	Memiliki	1 Sertifikat
A003	Alfandhy	Aktif	40-130 SKS	3.26 - 3.40	18 - 23 Tahun	Tidak Memiliki	Tidak Memiliki	4	Memiliki	Memiliki	2-3 Sertifikat
A004	Andi Zanira Mansyur	Aktif	40-130 SKS	3.26 - 3.40	18 - 23 Tahun	Memiliki	Memiliki	4	Memiliki	Memiliki	2-3 Sertifikat
A005	Ardi Mawardi	Aktif	40-130 SKS	3.61 - 3.80	18 - 23 Tahun	Memiliki	Memiliki	3	Tidak Memiliki	Memiliki	1 Sertifikat
A006	Arfandy	Aktif	40-130 SKS	3.00 - 3.25	18 - 23 Tahun	Memiliki	Tidak Memiliki	5	Memiliki	Memiliki	3-5 Sertifikat

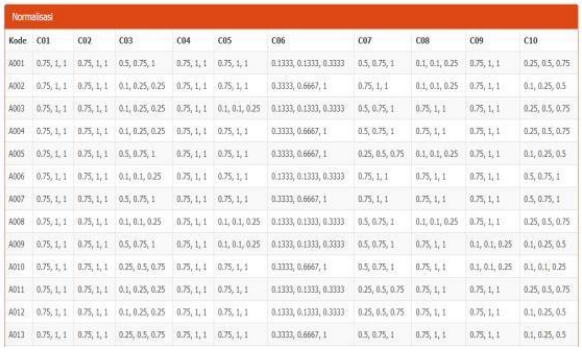
Figure 10. SAW Calculation Page



Nilai Fuzzy

Kode	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10
A001	0.75, 1, 1	0.75, 1, 1	0.5, 0.75, 1	0.75, 1, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.5, 0.75, 1	0.1, 0.1, 0.25	0.75, 1, 1	0.25, 0.5, 0.75
A002	0.75, 1, 1	0.75, 1, 1	0.1, 0.25, 0.25	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75	0.75, 1, 1	0.1, 0.1, 0.25	0.75, 1, 1	0.1, 0.25, 0.5
A003	0.75, 1, 1	0.75, 1, 1	0.1, 0.25, 0.25	0.75, 1, 1	0.1, 0.1, 0.25	0.1, 0.1, 0.25	0.5, 0.75, 1	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75
A004	0.75, 1, 1	0.75, 1, 1	0.1, 0.25, 0.25	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75	0.5, 0.75, 1	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75
A005	0.75, 1, 1	0.75, 1, 1	0.5, 0.75, 1	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75	0.25, 0.5, 0.75	0.1, 0.1, 0.25	0.75, 1, 1	0.1, 0.25, 0.5
A006	0.75, 1, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.75, 1, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.75, 1, 1	0.75, 1, 1	0.75, 1, 1	0.5, 0.75, 1
A007	0.75, 1, 1	0.75, 1, 1	0.5, 0.75, 1	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75	0.75, 1, 1	0.75, 1, 1	0.75, 1, 1	0.5, 0.75, 1
A008	0.75, 1, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.75, 1, 1	0.1, 0.1, 0.25	0.1, 0.1, 0.25	0.5, 0.75, 1	0.1, 0.1, 0.25	0.75, 1, 1	0.25, 0.5, 0.75
A009	0.75, 1, 1	0.75, 1, 1	0.5, 0.75, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.1, 0.1, 0.25	0.5, 0.75, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.1, 0.25, 0.5
A010	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75	0.5, 0.75, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.1, 0.1, 0.25
A011	0.75, 1, 1	0.75, 1, 1	0.1, 0.25, 0.25	0.75, 1, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.25, 0.5, 0.75	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75
A012	0.75, 1, 1	0.75, 1, 1	0.1, 0.25, 0.25	0.75, 1, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.25, 0.5, 0.75	0.75, 1, 1	0.75, 1, 1	0.1, 0.25, 0.5

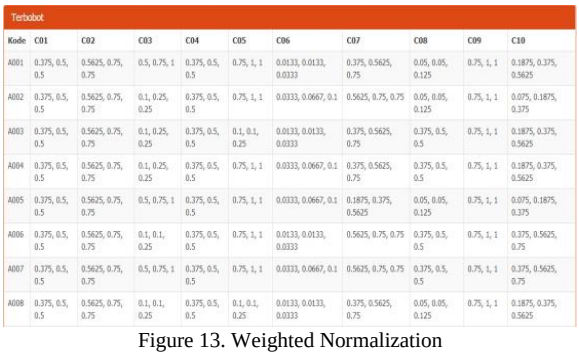
Figure 11. Display the analysis results from the calculation of SAW



Normalisasi

Kode	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10
A001	0.75, 1, 1	0.75, 1, 1	0.5, 0.75, 1	0.75, 1, 1	0.75, 1, 1	0.1333, 0.1333, 0.3333	0.5, 0.75, 1	0.1, 0.1, 0.25	0.75, 1, 1	0.25, 0.5, 0.75
A002	0.75, 1, 1	0.75, 1, 1	0.1, 0.25, 0.25	0.75, 1, 1	0.75, 1, 1	0.3333, 0.6667, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.75, 1, 1	0.1, 0.25, 0.5
A003	0.75, 1, 1	0.75, 1, 1	0.1, 0.25, 0.25	0.75, 1, 1	0.1, 0.1, 0.25	0.1333, 0.1333, 0.3333	0.5, 0.75, 1	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75
A004	0.75, 1, 1	0.75, 1, 1	0.1, 0.25, 0.25	0.75, 1, 1	0.75, 1, 1	0.3333, 0.6667, 1	0.5, 0.75, 1	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75
A005	0.75, 1, 1	0.75, 1, 1	0.5, 0.75, 1	0.75, 1, 1	0.75, 1, 1	0.3333, 0.6667, 1	0.25, 0.5, 0.75	0.1, 0.1, 0.25	0.75, 1, 1	0.1, 0.25, 0.5
A006	0.75, 1, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.75, 1, 1	0.75, 1, 1	0.1333, 0.1333, 0.3333	0.75, 1, 1	0.75, 1, 1	0.75, 1, 1	0.5, 0.75, 1
A007	0.75, 1, 1	0.75, 1, 1	0.5, 0.75, 1	0.75, 1, 1	0.75, 1, 1	0.3333, 0.6667, 1	0.75, 1, 1	0.75, 1, 1	0.75, 1, 1	0.5, 0.75, 1
A008	0.75, 1, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.75, 1, 1	0.1, 0.1, 0.25	0.1333, 0.1333, 0.3333	0.5, 0.75, 1	0.1, 0.1, 0.25	0.75, 1, 1	0.25, 0.5, 0.75
A009	0.75, 1, 1	0.75, 1, 1	0.5, 0.75, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.1333, 0.1333, 0.3333	0.5, 0.75, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.1, 0.25, 0.5
A010	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75	0.75, 1, 1	0.75, 1, 1	0.3333, 0.6667, 1	0.5, 0.75, 1	0.75, 1, 1	0.1, 0.1, 0.25	0.1, 0.1, 0.25
A011	0.75, 1, 1	0.75, 1, 1	0.1, 0.25, 0.25	0.75, 1, 1	0.75, 1, 1	0.1333, 0.1333, 0.3333	0.25, 0.5, 0.75	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75
A012	0.75, 1, 1	0.75, 1, 1	0.1, 0.25, 0.25	0.75, 1, 1	0.75, 1, 1	0.1333, 0.1333, 0.3333	0.25, 0.5, 0.75	0.75, 1, 1	0.75, 1, 1	0.1, 0.25, 0.5
A013	0.75, 1, 1	0.75, 1, 1	0.25, 0.5, 0.75	0.75, 1, 1	0.75, 1, 1	0.3333, 0.6667, 1	0.5, 0.75, 1	0.75, 1, 1	0.75, 1, 1	0.1, 0.25, 0.5

Figure 12. Normalization



Terbobot

Kode	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10
A001	0.375, 0.5, 0.5	0.5625, 0.75, 0.75	0.5, 0.75, 1	0.375, 0.5, 0.5	0.75, 1, 1	0.0133, 0.0133, 0.0333	0.375, 0.5625, 0.75	0.05, 0.05, 0.125	0.75, 1, 1	0.1875, 0.375, 0.5625
A002	0.375, 0.5, 0.5	0.5625, 0.75, 0.75	0.1, 0.25, 0.25	0.375, 0.5, 0.5	0.75, 1, 1	0.0333, 0.0667, 0.1	0.5625, 0.75, 0.75	0.05, 0.05, 0.125	0.75, 1, 1	0.075, 0.1875, 0.375
A003	0.375, 0.5, 0.5	0.5625, 0.75, 0.75	0.1, 0.25, 0.25	0.375, 0.5, 0.5	0.1, 0.1, 0.25	0.0133, 0.0133, 0.0333	0.375, 0.5625, 0.75	0.375, 0.5, 0.5	0.75, 1, 1	0.1875, 0.375, 0.5625
A004	0.375, 0.5, 0.5	0.5625, 0.75, 0.75	0.1, 0.25, 0.25	0.375, 0.5, 0.5	0.75, 1, 1	0.0333, 0.0667, 0.1	0.375, 0.5625, 0.75	0.375, 0.5, 0.5	0.75, 1, 1	0.1875, 0.375, 0.5625
A005	0.375, 0.5, 0.5	0.5625, 0.75, 0.75	0.5, 0.75, 1	0.375, 0.5, 0.5	0.75, 1, 1	0.0333, 0.0667, 0.1	0.1875, 0.375, 0.5625	0.05, 0.05, 0.125	0.75, 1, 1	0.075, 0.1875, 0.375
A006	0.375, 0.5, 0.5	0.5625, 0.75, 0.75	0.1, 0.1, 0.25	0.375, 0.5, 0.5	0.75, 1, 1	0.0133, 0.0133, 0.0333	0.5625, 0.75, 0.75	0.375, 0.5, 0.5	0.75, 1, 1	0.375, 0.5625, 0.75
A007	0.375, 0.5, 0.5	0.5625, 0.75, 0.75	0.5, 0.75, 1	0.375, 0.5, 0.5	0.75, 1, 1	0.0333, 0.0667, 0.1	0.5625, 0.75, 0.75	0.375, 0.5, 0.5	0.75, 1, 1	0.375, 0.5625, 0.75
A008	0.375, 0.5, 0.5	0.5625, 0.75, 0.75	0.1, 0.1, 0.25	0.375, 0.5, 0.5	0.1, 0.1, 0.25	0.0133, 0.0133, 0.0333	0.375, 0.5625, 0.75	0.05, 0.05, 0.125	0.75, 1, 1	0.1875, 0.375, 0.5625

Figure 13. Weighted Normalization

Rata-Rata

Kode	C01	C02	C03	C04	C05	C06	C07	C08	C09	C10
A001	0.4583	0.6875	0.75	0.4583	0.9167	0.02	0.5625	0.075	0.9167	0.375
A002	0.4583	0.6875	0.2	0.4583	0.9167	0.0667	0.6875	0.075	0.9167	0.2125
A003	0.4583	0.6875	0.2	0.4583	0.15	0.02	0.5625	0.4583	0.9167	0.375
A004	0.4583	0.6875	0.2	0.4583	0.9167	0.0667	0.5625	0.4583	0.9167	0.375
A005	0.4583	0.6875	0.75	0.4583	0.9167	0.0667	0.375	0.075	0.9167	0.2125
A006	0.4583	0.6875	0.15	0.4583	0.9167	0.02	0.6875	0.4583	0.9167	0.5625
A007	0.4583	0.6875	0.75	0.4583	0.9167	0.0667	0.6875	0.4583	0.9167	0.5625
A008	0.4583	0.6875	0.15	0.4583	0.15	0.02	0.5625	0.075	0.9167	0.375
A009	0.4583	0.6875	0.75	0.4583	0.15	0.02	0.5625	0.4583	0.15	0.2125
A010	0.4583	0.6875	0.5	0.4583	0.9167	0.0667	0.5625	0.4583	0.15	0.1125
A011	0.4583	0.6875	0.2	0.4583	0.9167	0.02	0.375	0.4583	0.9167	0.375
A012	0.4583	0.6875	0.2	0.4583	0.9167	0.02	0.375	0.4583	0.9167	0.2125

Figure 14. The average value of the calculation of SAW

Perangkingan

Rank	Kode	Nama	Total
1	A007	Dewi Shintya Maharani	5.9625
2	A049	Yudistira	5.8375
3	A066	Nurmadina	5.8167
4	A060	Sitti Nadirah	5.775
5	A061	Nur Fadhila	5.65
6	A035	Nurhayati	5.6125
7	A065	Irwandi	5.5875
8	A016	Husnus Fahmi	5.5792
9	A054	Seaklangi	5.4408
10	A064	Femi Revausi	5.4408
11	A078	Feni Arbania	5.4
12	A073	Nur Wahida	5.4

Figure 15. The ranking display of the SAW method

Pasword Page

The admin password page menu in Figure 16 functions to change the password, namely replacing the old password with a new password.

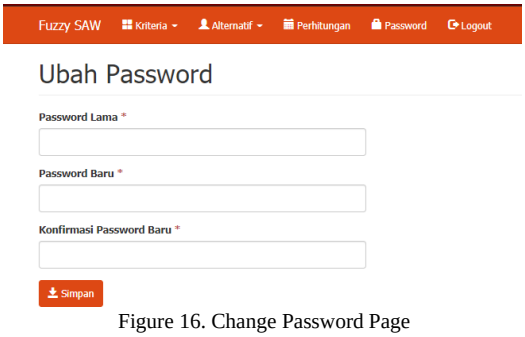


Figure 16. Change Password Page

Conclusions and suggestion

Conclusions

Based on the results of the tests that have been carried out, it can be concluded that the decision support system (SPK) that has been made has met the expectations of being able to assist in determining Bank Indonesia Scholarship Recipients by implementing the Fuzzy method as weighting and SAW performing calculations with predetermined criteria. Where the results of the black box test can be concluded that the system is able to meet the functional requirements or is running well, and produces a recommendation in determining Bank Indonesia Scholarship Recipients, based on the test results of 100 data testing carried out, an accuracy rate of 84% is obtained with a comparison of the amount of data that is not 16 valid data and 84 valid data.

Suggestion

1. Further researchers who want to develop a decision support system regarding the determination of prospective home renovation recipients can be done by adding criteria using the FMADM and SAW methods
2. Using another method in the weighting of the criteria. As a comparison of the results of the accuracy of the method, so that later it can be used as a reference for further researchers.

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