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Ultimate Solution Of Saw Dan Topsis Web-Based Methods For Scholarship Recipients At The Foundation Aldiana Nusantara

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ABSTRACT

The role of information systems is currently crucial in various fields, including education and Yayasan Aldiana Nusantara (YAN), which supports many students from low to middle economic backgrounds, faces challenges in selecting scholarship recipients for financially disadvantaged students. To assist in making accurate and swift decisions, a computer-based Decision Support System (DSS) is required. This study aims to design a web-based DSS using the Simple Additive Weighting (SAW) and Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) methods. This system was designed to assist Yayasan Aldiana Nusantara - YAN in selecting scholarship recipients based on criteria, such as, grade level, scholarship recipient status, father's income, mother's income, report card grades, and the number of extracurricular activities. The SAW method is used for weighting criteria, while the TOPSIS method is used to rank alternatives based on their proximity to the ideal solution. The system design follows the waterfall model, comprising analysis, design, implementation, and testing phases. The DSS is developed using PHP programming language and MySQL Database Management System. The system provides four types of access rights: administrator, jury, student, and faculty leader, ensuring security and ease of use. The test results indicate that the system has a high level of accuracy, reliability, integrity, and usability. This system also helps expedite the scholarship selection process, reduce errors in recipient determination, and facilitate the selection team in decision-making. With this DSS, YAN is able to conduct the scholarship selection process more effectively and efficiently, ensuring that aid is accurately targeted at students in need.

Keywords: DSS, SAW, TOPSIS, Scholarship, Yayasan Aldiana Nusantara

INTRODUCTION

Currently, the role of information systems is very important and the rapid development of technology is increasingly increasing the role of information systems in all fields, from education to business in companies, institutions or institutions, all using information systems. This triggers all companies, institutions or institutions to optimize and utilize the use of information technology (IT) based on their needs. As one example, company, institution or institution leaders can obtain a number of very important information with the existence of an information system. Information is very much needed in the decision-making process and good and right decisions need

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to be supported by the availability of accurate, fast and sufficient information. The use of computers in data processing produces fast and accurate information, because fast and accurate information supports the right decision-making and ultimately benefits the parties concerned. One information system that can help leaders in carrying out their duties is a computer-based decision support system (Decision Support System). Decision making is an approach to producing various alternative decisions in dealing with problems that are semi-structured or unstructured, for example, educational institutions to determine scholarships for their students. Realizing that education is very important, the state strongly supports every citizen to achieve the highest education. Some of them carry out scholarship programs because scholarships are funding that does not come from self-funding or parents, but is provided by the government, private companies, embassies, universities, and educational institutions or researchers. In educational institutions, many decisions must be taken where these decisions must be truly selective. YAN is an educational foundation founded in 1995 and opened A, B and C package courses as well as English courses and Diploma 1 (D1) and D2 Hospitality Programs. In 1999 it was officially registered with a notary and is located on Jalan Ir. H. Juanda Ciputat, South Tangerang. YAN also opened Vocational Schools, namely SMK Nusantara 1 Ciputat, SMP Nusantara Plus, SMA Nusantara Plus, SMK Nusantara 2 Kesehatan, with the number of students up to the 2023/2024 school year are 1752. Of all students under the auspices of YAN, 80% are classified as people with lower middle economic levels, even as many as 50% of that number are people with low economic levels. They are generally unable to fulfill administrative obligations so that excessive arrears on participants have hampered the teaching and learning process at school. Therefore, YAN provides scholarships to students with certain criteria to help facilitate the teaching and learning process for students and especially for the school itself. Given the limited scholarships, SPK based on SAW and TOPSIS based on PHP programming language and MySQL Database Management System have been used. This system provides four types of access rights: administrator, jury, student, and faculty leader, which guarantees security and ease of use. The test results show that this system has a high level of accuracy, reliability, integrity, and usability.

LITERATURE STUDY AND THEORY

Decision Support System (DSS) is a system that is able to provide problem-solving capabilities and communication capabilities for problems with semi-structured and unstructured conditions and has been applied in various problem solving [1-13]. DSS aims to provide information, guide, provide predictions and direct users of information so that they can make better decisions. DSS is an implementation of decision-making theories that have been introduced by sciences such as operation research and management science, however, the difference is that if in the past to find solutions to problems faced, manual iteration calculations had to be carried out (usually to find minimum, maximum, or optimum values), currently PC computers have offered their ability to solve the same problems in a relatively short time. The components of data management DSS include a database containing relevant data and regulated by a system called a database management system (DBMS), model

management, user interface, knowledge-based subsystems. The general conceptual model of DSS can be seen in Figure 1.

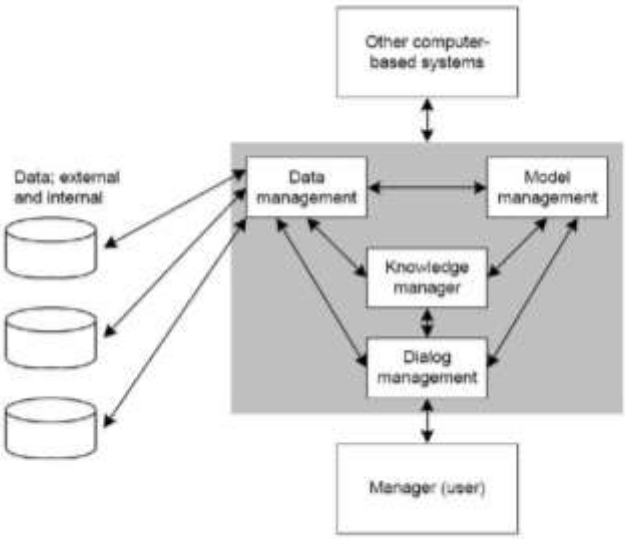


Figure 1. Conceptual Model of DSS.

In general, the decision-making process includes three main stages, namely the intelligence, design, and selection stages. The four stages can be explained as follows, namely a) the search stage is the stage of defining the problem and identifying the information needed related to the problem faced and the decision to be taken, b) design is the analysis stage in relation to finding or formulating alternative solutions to the problem, c) selection refers to the formulation of objectives and expected results, then management chooses the most appropriate alternative solution and d) implementation is the stage of implementing the decision that has been taken. The Simple Additive Weighting (SAW) method is also often known as the weighted summation method and the basic concept of the SAW method is to find the weighted summation of the performance ratings for each alternative. The SAW method requires a normalization process of the decision matrix (X) to a scale that can be compared with all existing alternative ratings. This method is the most famous and most widely used method in dealing with multiple attribute decision making (MADM) situations. MADM is a method used to find the optimal alternative from a number of alternatives with certain criteria and the SAW method requires decision makers to determine the weight for each attribute. The total score for an alternative is obtained by summing all the products of the ratings (which can be compared across attributes) and the weights of each attribute. The rating of each attribute must be dimensionless in the sense that it has gone through the previous matrix normalization process.

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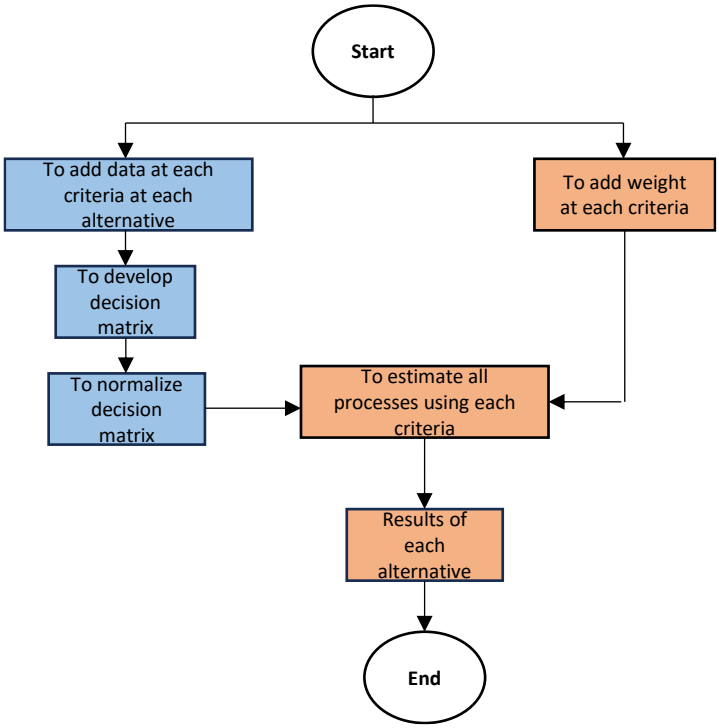


Figure 2. Steps of SAW Method.

The following are the steps of the SAW method, namely 1) determining the criteria that will be used as a reference in decision making, namely Ci then determining the suitability rating of each alternative for each criterion, 2) creating a decision matrix based on the criteria (Ci), then normalizing the matrix based on the equation adjusted to the type of attribute (benefit attribute or cost attribute) so that the normalized matrix R is obtained, and c) the final result is obtained from the ranking process, namely the sum of the multiplication of the normalized matrix R with the weight vector so that the largest value is selected as the best alternative (Ai) as a solution. The formula for performing this normalization is done by using the benefit and cost attribute formulas. To determine the relative proximity from a geometric point of view, the TOPSIS (Technique for Order Preference by Similarity of Ideal Solution) method uses the principle that the selected alternative must have the shortest distance from the positive ideal solution and the longest (furthest) distance from the negative ideal solution. This distance is measured using the Euclidean distance (distance between two points), which can be used to determine how close an alternative is to the ideal solution. The best values obtained for each attribute are added to produce a positive ideal solution, while the worst values obtained for each attribute are combined to produce a negative ideal solution and the stages are as follows.

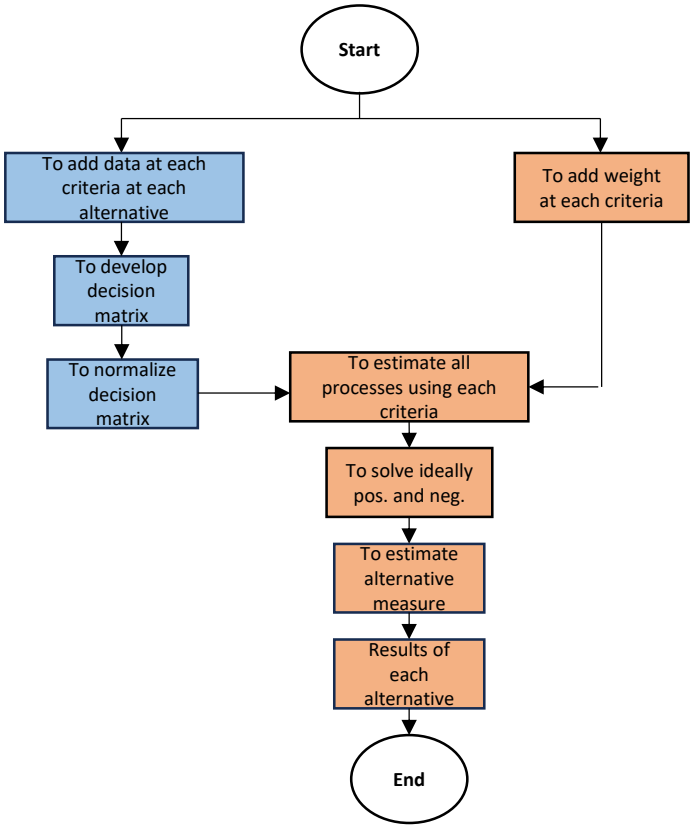


Figure 3. Steps of TOPSIS Method.

The following are the steps of the TOPSIS method, namely creating a normalized pairwise comparison matrix, and a weighted comparison matrix. Determine the positive ideal solution (A+) and the negative ideal solution (A-) based on the weighted branch matrix value in step 3. The following equations (1) and (2) have been used to find the positive ideal solution value and the positive ideal solution value and the negative ideal solution value. To calculate the distance between the weighted value (D) of each alternative to the negative ideal solution, the following equations are used, so that the preference value (V) of each alternative is obtained.

$$\boldsymbol{D_{i+}} = \sqrt{\sum_{\boldsymbol{i=1}}^{\boldsymbol{n}} (\boldsymbol{y_{ij}} - \boldsymbol{y_i^-})^{\boldsymbol{2}}} \quad (1)$$

$$V_{\mathrm{i}} = \frac{\mathrm{D_i^-}}{\mathrm{D_i^-} + \mathrm{D_i^+}} \quad (2)$$

RESEARCH METHOD

The research method that has been carried out is in Figure 4 and from the flow diagram in the figure, it can be explained, first, by compiling a framework or basic concept of the research that will be carried out. This framework of thought describes the flow or systematic steps that will be followed to achieve the research objectives.

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Then, compiling the research background, namely an explanation of the reasons for conducting this research. This includes the problems or needs that are the basis for the research, as well as the relevance and importance of the research. Identifying and detailing the problems faced and at this stage, the problems studied are described specifically and in detail so that they can be clearly understood. This problem formulation is usually in the form of research questions that will be answered through this research. Collecting data that is relevant to the research and in this case the 2023-2024 student dataset was selected and the data was used as analysis material in the research. In choosing the appropriate data processing method, the SAW and TOPSIS methods have been used. This stage involves processing the data that has been collected to obtain the desired results. Website-based system design, testing and conclusions that include the main findings of the research, answers to the problem formulation, and recommendations for further research or development. Each of these steps must be carried out systematically and sequentially to ensure that the research runs well and the results obtained are valid and useful.

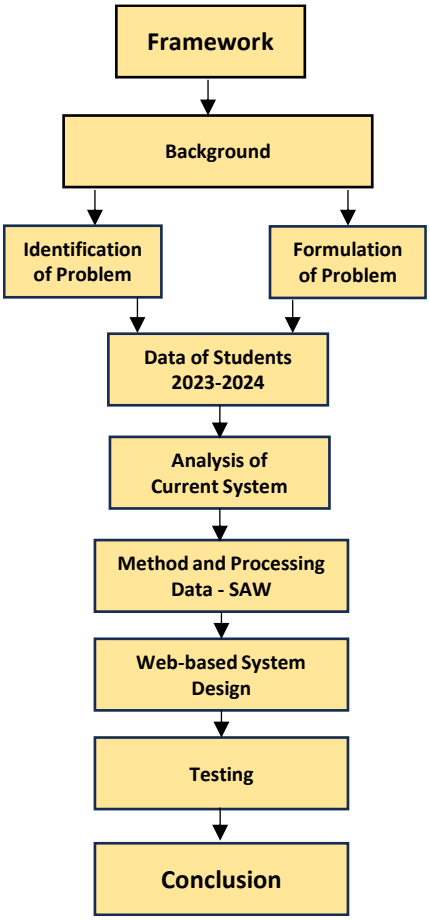


Figure 4. Flow Chart of Research Activities.

Every year, YAN provides scholarships to students who are eligible to receive them. In accordance with the rules made, the determination of scholarship recipients is students who have successfully achieved high achievements, both curricular, co-curricular, and extracurricular according to the specified criteria. Prospective scholarship recipients must be able to meet criteria such as semester grades, parental income and achievements. The selection of scholarship recipients which is held every year makes quite a few students want to register. Meanwhile, the leadership must assess and collect it to the head of the foundation, then the data processing is carried out to determine the scholarship recipients. So a method is needed that can facilitate the process of selecting scholarship recipients in schools under the auspices of YAN. Therefore, a website-based SPK has been created to assist the process of scholarship recipients at YAN. The SPK is designed to record students who register for the selection of scholarship recipients, record the assessments made by the jury and process data from students who register with certain criteria so that results or rankings are obtained from each student and a list of scholarship recipients is obtained. This system is able to provide solutions that are close to real solutions that are effective and efficient. In addition, because it is supported by the availability of existing hardware and software, as well as the availability of reliable human resources, it is able to manage the computer-based system.

RESULTS AND DISCUSSION

For the research data needs, the dataset of students of SMKS Nusantara II Kesehatan for the 2023-2024 Academic Year will be used. The datasets needed as criteria for research calculations include name, student ID number, gender, report card grades, and others. Then continued with, the process design is described in the form of a Data Flow Diagram (DFD) starting from the highest level, namely level 0 (Context Diagram) which describes the system as a whole which is then lowered to lower levels. In short, the SPK for selecting YAN scholarship recipients interacts with 4 external entities, namely admin, jury, user and leader. Figure 4 is a detailed part of the SPK for selecting scholarship recipients. The user data input process is carried out by students, the validation process is carried out by the jury, while the scholarship data input process, criteria and selection process are carried out by the admin on the scholarship participant biodata, participant file validation, participant input process and selection result process. The selection result process for selecting outstanding students goes through 2 processes, namely the data collection process based on criteria, then the criteria weight is obtained which is used for the calculation process. After completing the 2 processes, the results of the scholarship recipient selection using SAW and TOPSIS are obtained.

Figure 5 explains the SAW calculation process which goes through 3 stages of the process, namely the weight input process, criteria results and criteria normalization. The criteria input process is a process where the admin inputs the criteria weight with a certain value. Then, the criteria results are the process of processing the criteria input according to the SAW calculation algorithm. While the criteria normalization process is the normalization of the criteria process and then saved to the criteria table. Furthermore, the TOPSIS calculation process is described in detail in the DFD level 3 of the TOPSIS calculation process in Figure 6. This level is

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a selection process with calculations using the TOPSIS method and there are 7 stages of the process, namely the initial data process, conversion, weight normalization, positive negative ideal solutions, separation measures and ranking process.

In Figure 4, the initial data process is the initial process of the TOPSIS method, and this process displays all participants in the selection of scholarship recipients equipped with the values of each predetermined criteria. The conversion process is the process of converting the applicants' data to the conversion of the predetermined values and then the normalization weighting process is the process of multiplying the results with the converted data multiplied by the criteria weight data that has been obtained. The process of positive and negative ideal solutions is the process of finding the highest and lowest values from all participants according to their respective criteria. Continued by the process of measuring the distance, namely finding dmax and dmin for each participant and the final result process (ranking) is the calculation of the proximity values of dmax and dmin to positive and negative ideal solutions.

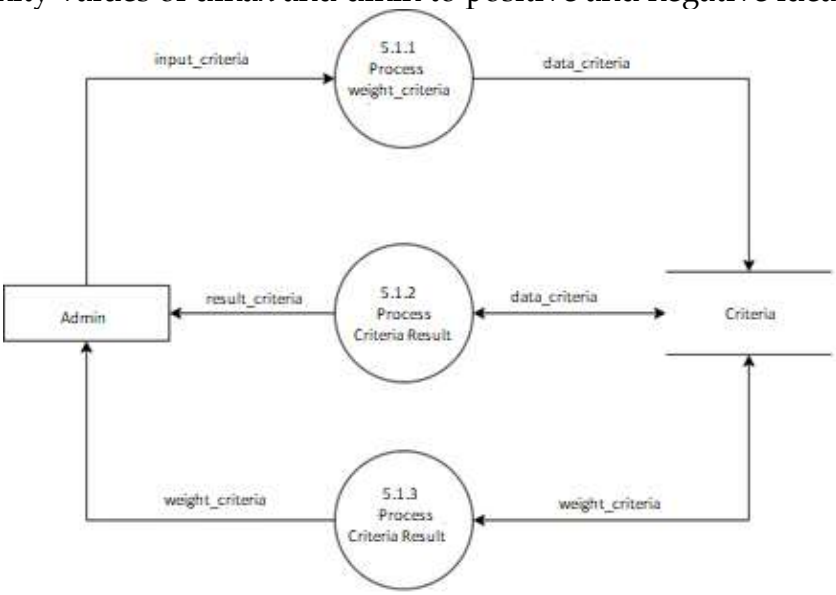


Figure 5. DFD Level 3 Using SAW.

Results of SPK Design Based on SAW and TOPSIS

The database design of SPK for selecting scholarship recipients contains five tables and the five tables are obtained after the results of normalization to the 2nd form and the user table, form, criteria, assessment, and achievement are obtained. The data required in the SPK for selecting outstanding students are presented in the users table which contains the user's id and email, the user's full name, username, password and user activity. In addition, there are also several Auth Groups tables (user, permission, school unit, scholarship table. Specifically, the scholarship table is used to store scholarship period data in YAN, the scholarship table structure, the scholarship table contains the user_id where this field is related to the user_id in the users table. The data types required are int with a width of 11, scholarship_name varchar with a width of 255, quota type int with a width of 11 and the start date and end date are of the datetime type because the data required is time. There is also a job table used to store the types of jobs used on the scholarship form, the job table also contains the Crips value used in the SPK method. The job table structure contains the id and code

with the int type with a width of 11, job name varchar with a width of 255 and other tables contain income, scholarship forms, criteria, normalization and ranking.

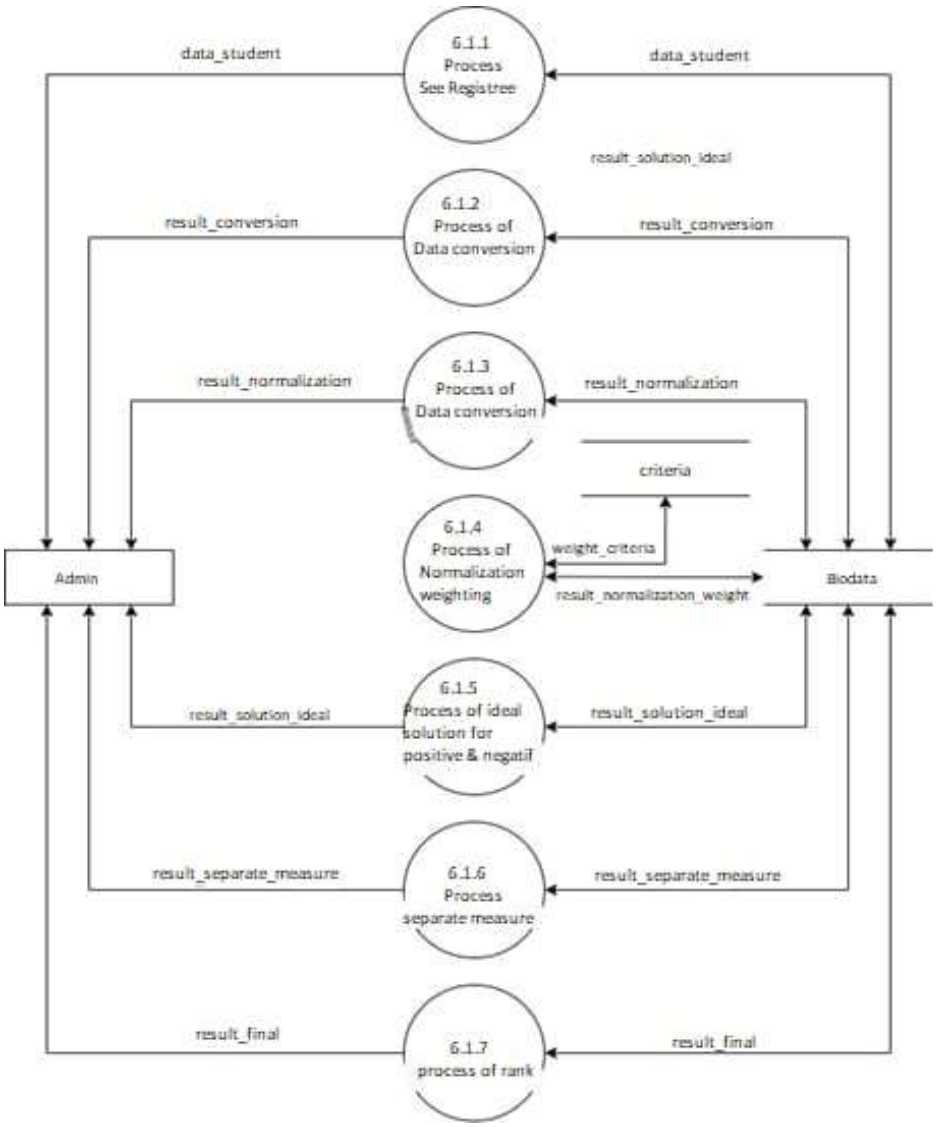


Figure 6. DFD Level 3 Using TOPSIS.

The system implementation stage is the next stage of system design, and at this stage it is necessary to evaluate the system performance to find out whether the system is running according to needs so that if there are errors it can be seen. The SPK for selecting scholarship recipients using the SAW and TOPSIS calculation methods is made web-based using the PHP programming language and MySQL database. The interface is designed using a responsive design, namely the website display will follow the monitor screen used. The display will be more optimal if using a monitor screen with a resolution of 1366 x 768 pixels. The appearance of the SPK scholarship application contains a login menu that can be accessed by users by filling in their username and password, then the system will check the registered role and then forwarded to the page with each role. The first interface display that appears when the program is run is the login menu display, the system user must first log in to find out the access rights (role) in this scholarship acceptance SPK. If the user logs in as a

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superadmin, they will be directed to the admin homepage, then the admin will be directed to the admin homepage and participants will be directed to the user homepage. The resulting design is a variety of interfaces, for example, the login menu, register menu, superadmin menu, user list menu, scholarship list menu, add scholarship menu.

SAW Data Processing and Results

SAW data processing consists of criteria input interface, criteria table, normalization, and ranking. The criteria interface displays information on the weighting value criteria for each scholarship selection criterion where the weighting value is carried out by YAN based on the priority scale of each criterion. The assignment of attributes to each criterion is based on the nature of each criterion, for example, in the father's income criterion, namely cost, it can be interpreted that the higher the participant's father's income, the smaller the chance of getting a scholarship. Conversely, the benefit report card value criterion means that the greater the participant's report card value, the greater the chance of getting the scholarship. The alternative interface displays information on scholarship applicant data and displays the value of each criterion, then because the value of each criterion is different in type, a conversion or crips process is needed, namely changing the value of each criterion into numeric data. The value of the criteria and the Crips value refer to the basic education data (DAPODIK) in schools in the YAN environment. In the design results, there is a weighted normalization interface displaying information on the results of multiplying the normalization table by the weight value of each criterion that has been carried out. In addition, the design also contains a variety of interfaces, for example, calculation results, final results, user menus, user dashboards, scholarship proposals, scholarship forms, scholarship announcements and others.

The results of data processing on the SPK for selecting scholarship recipients using the SAW method and the TOPSIS method are stages where the system is used to find decision results based on predetermined criteria. Data processing begins with the first step, namely determining the weight for each relevant criterion in decision making. This weight reflects the level of importance of each criterion to the objectives to be achieved and the weighting can be seen in Table 1.

Table 1. Criteria of Weight.

No	Name of Criteria	Value of Weight	Atribute	No	Name of Criteria	Value of Weight	Atribute
1	Kelas	20	Benefit	4	Mother salary	15	Cost
2	Recipients of scholarship	10	Cost	5	Report grading	30	Benefit

3	Father salary	20	Cost	6	Extracurricul a	5	Benefit

The numbers indicate the weight or level of importance of each criterion in decision making and this weight determines how much influence each criterion has on the final result. The higher the weight value, the greater the influence on the decision making, while the attribute states whether the criterion is "Benefit" or "Cost". The "Benefit" criterion is a criterion that the higher the value the better, while the "Cost" criterion is the opposite, the lower the value the better. Furthermore, the data of scholarship participants that have been declared valid by the jury will appear in the alternative column in the system and in the alternative column, participants who were declared valid by the jury were 105 participants. This column also displays participant data that was inputted during the scholarship registration process based on the specified criteria.

Finalization of SAW Method Data Processing

In the SAW method, the next process in the scholarship selection SPK is the normalization process, and the normalization process is different for the benefit and cost criteria. In the benefit criteria, the normalization value is calculated by dividing each alternative value by the maximum value in the criteria column. While in the cost criteria, the normalization value is calculated by dividing the minimum value in the criteria column by each alternative value. The normalization results in the SPK for selecting scholarship recipients using the SAW method are based on the results that C1 represents the class criteria with the benefit attribute, C2 represents the KPS/KIP/KKS Recipient with the cost attribute, C3 represents the Father's Income with the cost attribute, C4 represents the Mother's Income with the cost attribute, C4 represents the report card value with the benefit attribute and C6 represents extracurricular activities that have the benefit attribute. For example, column C1 has a maximum value of 3, C2 has a minimum value of 1, C3 has a minimum value of 1, C4 has a minimum value of 1, C5 has a maximum value of 4, C6 has a maximum value of 3, while data A1 or student 1 has data as written as follows, for example with class 2, KPS/KIP/KKS recipient 2, father's income 5, mother's income 1, report card value 4, extracurricular 1, so that the normalization results are 0.67, 0.5, 0.2, 1, 1, and 0.333. The next step is to multiply the normalization value by the appropriate criteria weight. This contributes weight to each alternative value. After that, the results of multiplying the normalization value by the criteria weight on the SPK of scholarship recipients using the SAW method are obtained. These results are obtained by multiplying the normalization value and the weight value on each criterion, for example, the weight of criteria C1 is 20, the weight of criteria C2 is 10, the weight of criteria C3 is 20, the weight of criteria C4 is 15, the weight of criteria C5 is 30 and the weight of criteria C6 is 5, while the normalization value on alternative A1 is C1 0.6667, C2 0.5, C3 0.2, C4 1, C5 1, and C6 0.3333, finally the following results are obtained Vi, 13.333, 5, 4, 15, 30 and 1.667.

After all the weight values are calculated, the next step is to add up the weight values for each alternative and this gives a final score for each alternative to then be sorted based on the final score of each alternative from the highest to the lowest, so

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that selected participants are found based on the quota of the scholarship registered. The result of adding up the weight values in the SPK for selecting scholarship recipients using the SAW method is finally obtained. This result is the result of adding up the weight values for each alternative so that the final score is obtained. For example, the result of multiplying the normalization value by the weight on each criterion of Student 1 or A1, obtained C1 13.33, C2 5, C3 4, C4 15, C5 30, C6 1.67, resulting in V 69. The results are then sorted according to the quota on the scholarship followed by the participants, For example, the quota for the scholarship is 85 participants, determined from 105 participants who registered, then the data processing process is carried out based on the existing criteria using the SAW method.

Finalization of TOPSIS Method Data Processing

In the TOPSIS method, after obtaining the conversion value of each alternative data to make it easier, a divisor value of each criterion is needed which is obtained from the square root of the sum of the values in each column of criteria that are squared and the result of the divisor value in each criterion, namely C1 22.93, C2 16.79, C3 36.19, C4 32.48, C5 27.98 and C6 26, 34. After the divisor value has been obtained, the next normalization process to change various data scales into a uniform scale is carried out, namely by dividing the conversion value results by the divisor value in each criterion. Based on the results obtained, C1 represents the class criteria with the benefit attribute, C2 represents the KPS/KIP/KKS recipients with the cost attribute, C3 represents the father's income with the cost attribute, C4 represents the mother's income with the cost attribute, C4 represents the report card value with the benefit attribute and C6 represents extracurricular activities that have the benefit attribute. The final ranking results using the SAW and TOPSIS methods can be seen in Table 2 below.

Table 2. Rank of Scholarships Recipients Using SAW and TOPSIS

No	TOPSIS		SAW	
	Name of Student	Result of Grading	Name of Student	Score
1	Student 91	0,597	Student 52	Skor
2	Student 52	5,626	Student 23	85
3	Student 29	5,608	Student 46	85
4	Student 75	5,470	Student 99	84
5	Student 99	5,411	Student 29	83.33
6	Student 100	5,411	Student 100	83.33
7	Student 65	5,270	Student 91	83.33
8	Student 55	0,050	Student 55	80.83
9	Student 104	5,060	Student 71	80.83
10	Student 23	5,047	Student 105	80.00
11	Student 71	4,914	Student 75	80.00
12	Student 105	4,913	Student 87	78.33
13	Student 53	4,864	Student 43	77.05
14	Student 47	4,651	Student 47	75.83
15	Student 94	4,615	Student 53	73.33

	Ect.	Ect.	Ect.	Ect.
	Ect.	Ect.	Ect.	Ect.
84	Student 3	2,916	Student 28	
85	Student 12	2,866	Student 49	51.08

Suitability Test for SAW and TOPSIS Methods

Table 3 shows a comparison of the calculation results of the SAW method and the Topsis method issued by the system and obtained 85 alternative data. Software system testing is a method by determining the quality of the device whether the system runs according to the needs used. The application that has been run has been tested using the Blackbox method and user questionnaires and for the suitability test, Blackbox Testing is used, namely a system testing technique that focuses on the functionality and specifications of the software and this testing method works by ignoring the control structure and focuses on domain information. In the SPK for the selection of scholarship recipients, Blackbox testing was carried out and the test results showed that users can access the user detail page, and can change the full name, email, user type and profile picture data and all are written with a successful status.

User Questionnaire

The user questionnaire is divided into 2 types, namely, testing to users and experts (computers). User testing is aimed at system users, namely students under the auspices of YAN who are scholarship participants as many as 5 students, scholarship selection jury and admin administrator. Expert testing is aimed at relevant sources in their fields and from the results of the questionnaire testing, calculations are made to determine comments, suggestions and conclusions regarding the assessment of the application being built. The McCall factors used in user testing are factors related to product operational factors, namely correctness (good), reliability (according to input), integrity (safe), and usability (easy to use). The questionnaire for experts (computers) consists of 10 questions arranged based on factors that are not tested to users (efficiency, maintainability, testability, flexibility, portability, and interoperability.). Each item has at least 1 question and a maximum of 6 questions that are very related to the topic. The survey value starts with strongly disagree (1). disagree (2), agree (3) and strongly agree (4), so it can be concluded that strongly agree 36.7%, and agree 63.7%.

Furthermore, the calculation of the average score of each aspect has produced that the correctness is 7.33 and based on these results, it is concluded that the average value of correctness is included in the very good criteria, meaning that the SPK meets user needs. For reliability 3.32, it is concluded that the average value of reliability is included in the very good criteria, meaning that the SPK can display information according to user input correctly. With integrity 3.42, it is concluded that the average value of integrity is included in the very good criteria, meaning that the SPK is safe from unauthorized parties. With usability 3.60, it is concluded that the average value is in the good criteria, meaning that the SPK display is attractive and easy to use. So, overall based on the beta test, the results obtained are that correctness is included in the very good criteria, reliability is included in the very good criteria, integrity is included in the very good criteria, usability is included in the good criteria. Finally,

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that the SPK for selecting outstanding students meets user needs, displays information according to user input correctly, is safe from unauthorized parties. And the SPK display is attractive and easy to use.

CONCLUSION AND SUGGESTIONS

Based on the results of the discussion of the SPK for selecting scholarship recipients for students in the YAN environment, it can be concluded that the website-based SPK designed using visual studio code software, MySQL Xampp 7 DBMS and with the PHP programming language has operated well. The SPK consists of 4 users, namely, superadmin jury or student admin and YAN leaders and the designed SPK has 3 main functions, namely registration, validation process, and processing of prospective scholarship recipient data. The SAW and TOPSIS methods have been used for processing participant data so as to provide solutions for scholarship recipient participants in schools under the auspices of YAN. Based on the Betha test, it was obtained that correctness is included in the very good criteria, reliability is included in the very good criteria, integrity is included in the very good criteria, usability is included in the good criteria, meaning that the SPK can meet user needs, such as helping the registration process, validation process and processing of scholarship recipient selection participant data. The scholarship recipient SPK has displayed information according to user input correctly. The SPK usage instructions help users and are safe from unauthorized parties and the appearance is attractive and easy to use. The suggestions needed are that the SPK that is built can be supplemented with other data that supports the selection of scholarship participants, and the weighting of the criteria can be made more automatic so that it is easier and more practical and the SPK can be applied in other schools that have cooperation with YAN.

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