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Article

Implementation of a Decision Support System Using the Simple Additive Weighting (SAW) Method in the New Student Admission Selection Process

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A B S T R A C T

The selection process for new student admissions in secondary schools is often manual and error-prone, so a web-based decision support system (DSS) is needed to improve objectivity and efficiency. This study aims to design and implement a DSS using the Simple Additive Weighting (SAW) method at SMK Negeri 1 Tanjung Lubuk. An applied quantitative approach with the Waterfall model was used; the population was all prospective students through three admission pathways, a sample of 23 purposive applicants. Instruments included academic data documents, interviews, and web input; data analysis via SAW (matrix normalization, criteria weighting, preference values). The results showed an accurate ranking with the highest score of 1.84 (Muhamad Angga Prayitno) based on five criteria (exam scores, report cards, KIP, achievement, distance). The conclusion states that the system increases transparency and speed of selection, and replication in other schools with broader testing is recommended.

1. Introduction

New student admission is a crucial process carried out annually in various vocational and general high schools in Indonesia because it directly relates to the quality of human resources that will be developed by educational institutions. Ideally, this process should be objective, efficient, and transparent, but in reality, many schools still utilize manual processing or spreadsheets, which are prone to calculation errors, time-consuming, and lack transparency in decision-making (Ismail & Ilham, 2022; Priandika & Wantoro, 2025). In the context of increasing numbers of applicants exceeding school capacity, the need for an information technology approach to assist the selection process is increasingly urgent, ensuring a more effective and targeted selection process (Muhammad Faiz Burhanuddin et al., 2025; Perdani, 2025). This demonstrates a common phenomenon in many educational institutions: traditional methods often fail to meet the demands of objectivity and efficiency in selecting prospective new students.

Furthermore, advances in information technology have fueled the adoption of web-based decision support systems (DSS) as a solution to simplify and accelerate decision-making based on complex criteria data (Priandika & Wantoro, 2025; Perdani, 2025). The use of the Simple Additive Weighting (SAW) method in DSS has become a popular choice in student admissions research due to its ability to generate alternative rankings of prospective students based on predetermined criteria weights (Ismail & Ilham, 2022; Perdani, 2025). This phenomenon is evident in various case studies in secondary schools, where SAW successfully minimizes selection errors and accelerates data processing compared to manual procedures (Ismail & Ilham, 2022; Perdani, 2025).

However, the implementation of SAW-based DSS in various schools still faces a number of significant technical and practical challenges. First, although numerous studies have shown that SAW can simplify the selection process, many developed systems still use a desktop or manual approach, thus suboptimal in terms of accessibility and real-time data integration (Ismail & Ilham, 2022; Perdani, 2025). This results in the decision-making process still requiring significant administrative intervention and being less responsive to changing school needs. Second, some DSS implementations still do not fully integrate calculation processes with web-based application platforms, so data processing and calculation functions are often separated from user-friendly interfaces for school users with non-technical backgrounds (Priandika & Wantoro, 2025; Perdani, 2025).

Another frequently encountered issue is the lack of transparency in the calculation model and weighting criteria used, often leaving schools and prospective participants unclear about how the final decision is reached (Ismail & Ilham, 2022; Perdani, 2025). This lack of clarity can undermine stakeholder trust in the system, particularly if it lacks adequate documentation and the ability to trace each step in the decision-making process. Furthermore, limitations in validation testing and evaluation of SPK in real-world scenarios often lead to a gap between research findings and field applications conducted by schools (Ismail & Ilham, 2022; Perdani, 2025). These shortcomings demonstrate that while SAW is effective in ranking, its implementation within a comprehensive system requires a more comprehensive approach, particularly in the context of data integration, interfaces, and calculation transparency.

This study aims to design and implement a web-based decision support system for new student admissions at SMK Negeri 1 Tanjung Lubuk using the Simple Additive Weighting (SAW) method, which is fully integrated from prospective student data collection to automatic ranking calculations. This research is important because it addresses the real needs of schools that experience difficulties in managing prospective student data quickly and accurately through manual systems, while simultaneously increasing objectivity in the selection process through an information technology-based application that can be accessed by the committee in real time (Ismail & Ilham, 2022; Priandika & Wantoro, 2025). The novelty of this research lies in the full integration between web development, SAW calculation procedures, and a user-friendly interface and transparency of ranking results, which has not been widely adopted in previous studies that often focus only on the calculation aspect without considering the end-to-end application quality (Perdani, 2025; Muhammad Faiz Burhanuddin et al., 2025). This approach is expected to not only improve the efficiency and effectiveness of selection but also provide a practical contribution to the implementation of web-based

DSS systems in the context of secondary education more broadly.

2. Literature Review

2.1. Challenges in Traditional Student Admission Processes

Manual new student admission processes in Indonesian secondary schools remain prevalent despite their limitations in handling increasing applicant volumes, leading to calculation errors, prolonged processing times, and lack of decision transparency (Ismail & Ilham, 2022; Priandika & Wantoro, 2025). These traditional methods struggle with multi-criteria decision-making involving academic scores, socioeconomic factors, and geographic considerations, often resulting in subjective selections that undermine institutional credibility (Hwang & Yoon, 1981; Triantaphyllou, 2000).

2.2. Decision Support Systems (DSS) in Education

Decision Support Systems have emerged as effective tools for educational institutions to automate complex multi-attribute selections, providing objective rankings through computational algorithms (Power, 2002; Arnott & Pervan, 2005). Web-based DSS implementations enable real-time data processing, stakeholder accessibility, and audit trails for enhanced accountability, addressing key deficiencies in manual systems (Burstein & Holsapple, 2008; Shim et al., 2002).

2.3. Simple Additive Weighting (SAW) Method Applications

The Simple Additive Weighting (SAW) method, also known as the weighted sum model, ranks alternatives by normalizing criteria values and applying predefined weights to compute preference scores (Hwang & Yoon, 1981; Churchman & Ackoff, 1954). In educational contexts, SAW effectively handles both benefit (e.g., exam scores, achievements) and cost criteria (e.g., distance to school) common in admission processes (Malczewski, 1999; Saaty, 1980). Recent implementations demonstrate SAW's superiority in producing convergent, transparent rankings for student selection (Kusumawardhani et al., 2023; Arifitama & Supriyadi, 2022).

2.4. SAW Implementations in Indonesian Student Admissions

Multiple studies validate SAW's efficacy for Indonesian school admissions, with implementations at vocational schools using criteria such as report cards (25-30% weight), entrance exams (30%), achievements (20%), socioeconomic status (15%), and distance (10%) mirroring current research parameters (Ardiyanto et al., 2024; Lestari, 2022). Web-based SAW systems reduce processing time from days to minutes while maintaining ranking accuracy above 95% compared to manual calculations (Perdani, 2025; Priandika & Wantoro, 2025).

2.5. Waterfall Model in Educational Software Development

The Waterfall model provides structured SDLC for educational DSS with well-defined requirements, progressing sequentially from analysis through implementation and maintenance (Royce, 1970; Pressman, 2010). Its documentation rigor supports regulatory compliance and future system evolution critical for institutional deployments (Sommerville, 2011; Jalote, 2005).

3. Research Methodology

3.1. Types and Methods of Research

This study uses a quantitative approach with an applied research approach focused on developing a decision support system for the student admissions selection process. The quantitative approach was chosen because it involves processing numerical data and assigning weights to several criteria to produce objective decision recommendations. The decision-making method used is Simple Additive Weighting (SAW), which is known to be effective in solving multi-criteria problems through a structured process of normalization and weighting of alternative values. The SAW method has been widely applied in the context of student admissions selection and has been proven to increase the objectivity and efficiency of the selection process (Lestari, 2022; Ardiyanto, 2024). The system development was carried out using the Waterfall model as part of the Software Development Life

Cycle because this model is systematic, sequential, and suitable for developing systems that have clear functional requirements from the outset (Widya & Habibah, 2022; Pressman, as cited in Widya & Habibah, 2022).

3.2. Research Population and Sample

The population in this study was all prospective new students who enrolled at SMK Negeri 1 Tanjung Lubuk through three admission channels: affirmative action, achievement, and regular admission. The research sample was taken from applicants who met the administrative and academic criteria in accordance with school regulations for the current academic year. The sampling technique used was purposive sampling, taking into account the completeness of school exam scores, average report card scores for semesters 1 through 5, ownership of a certificate of poverty, academic and non-academic achievements, and distance from home to school. This approach was chosen to ensure the analyzed data was truly relevant to the needs of the decision support system being developed (Sugiyono, 2022; Emzir, 2021).

3.3. Data Collection Instruments and Techniques

The research instruments used were academic data documents of prospective students, interview guidelines, and data input formats for the developed website-based system. Data collection was conducted through direct interviews with administrative staff and school operators to obtain an overview of the current selection system, as well as through documentation of new student registration data. Documentation techniques were used to obtain quantitative data in the form of school exam scores, report card grades, achievement data, and distance from student residence. The combination of interviews and documentation was chosen to ensure that the data used was not only administratively accurate but also met the needs of decision support system analysis (Sudaryono, 2021; Creswell & Creswell, 2021).

3.4. Data Analysis Techniques

Data analysis in this study was conducted using the Simple Additive Weighting (SAW) method, which includes criteria determination, weighting, scoring each alternative, decision matrix normalization, and calculating preference scores to rank prospective students. The criteria used consisted of school exam scores, average report card scores for semesters 1 through 5, certificates of poverty, academic achievement, and distance from school, with benefit and cost criteria classifications. The final score was obtained by multiplying the weighted criteria by the normalized score for each alternative. The alternative with the highest preference score was determined as the most deserving prospective student. This analysis technique is considered appropriate for producing objective, transparent, and easily understood decisions by decision-makers (Sukaryati, 2022; Triyono, 2020).

3.5. Research Procedures

The research procedure was carried out through several sequential stages, starting from identifying the new student admission selection problem, determining the research objectives, collecting and analyzing data, and developing and testing the system. The system development stage follows the Waterfall model, which includes needs analysis, system design using context diagrams, Data Flow Diagrams, flowcharts, and Entity Relationship Diagrams, website-based system implementation using PHP and the Laravel framework, and functional system testing. This stage aims to ensure that the developed decision support system can run according to user needs and produce accurate selection recommendations. The Waterfall model was chosen because it provides a clear and well-documented workflow, thus facilitating future system evaluation and maintenance (Witriyono, 2022; Widya & Habibah, 2022).

4. Results and Discussion

4.1 Research result

In this research result, the writer explains the results of implementing the New Student Admission Decision Support System using the SAW method at Vocational School Country 1 Capei Pool. Based on the study results, the new student admission selection process is conducted online through a website with registration steps that must fulfill certain criteria and conditions, including filling out student data, previous school data, and evaluation criteria data. The conditions

consist of 5 important points: school exam marks, average report card marks, letter of information/capability or assistance card, school distance, and performance. From these 5 points, the data will later be processed using the Simple Additive Weighting (SAW) method, which is a total weighting system to see the ranking results of registered candidate students.

4.2 Research Results Stages

1. Need System

On stage beginning implementation System Supporters Decision Reception Student New Use Method Simple Additive Weighting (PBUH) on Vocational School Country 1 Cape Pool, step important Which must prepared is identify need system.

A. **Need Device Hard (Hardware)**
   a. Laptop Acer Swift 3 with processor AMD Athlon And Graphic Radeon Vega RAM 8 GB
   b. Mouse

B. **Need Device Soft (Software)**
   a. *Visual Studio Code*
   b. *Xampp*
   c. Google Chrome

4.3 System Development Stages

On chapter previously has discussed about method processing data Which used that is method Simple Additive Weighting (PBUH) Then For support smoothness in process manufacturing application is writer use approach model Waterfall. Model Waterfall is model development device soft Which There is in model Sequential Development Life Cycle (SDLC).

1. Software Requirements Analysis

The needs collection process should be done in a way that motivates users to see and interact with the device or software, so that they can understand it and know what they need. The specification of the device or software at this stage must be documented.

2. Software Design

Design device soft is process multi step Which focus on design manufacturing program device soft including structure data, representation interface, And procedure coding. Stage This translate need device soft from stage analysis need to representation design So that can implemented become program on stage furthermore. On stage This writer make design design system use Diagram Context, Data Flow Diagram (DFD), Blockchart, Flochart, Entity Relationship Diagram (ERD). Besides design design system on stage This writer Also make design with use model Prototype, Design Prototype is model beginning or version simulation from something product, service, or system Which made For test And validate design And its function before produced in a way mass.

Implementation

Design must implement to in program device soft. Results from stage This is program computer in accordance with design Which has made on stage design.

1. Implementation of Decision Support System Calculation

In determination reception student new on Vocational School Country 1 Cape pool with method Simple Additive Weight (PBUH) based on criteria so obtained data as following:

a. Determination of Criteria

Table 1. Code Criteria, Name Criteria, Weight And Type

Code Criteria	Name Criteria	Weight (%)	Type
C1	Mark exam school	0.30	*Benefits*
C2	Mark average report card semester 1 until 5	0.25	*Benefits*
C3	Letter Information No capable	0.15	*Benefits*
C5	Distance address to school (km)	0.10	*Cost*
C4	Performance	0.20	*Benefits*

Table 2. Code Alternative, Name and Criteria

Code Alternative	Name	Criteria				
		C1	C2	C3	C4	C5
A1	Muhammad Amen	80	82	0	15	0
A2	Muslim	86	86	0	8	0

A3	Arifai	76	83	1	7	0
A4	Heri Santoso	86	86	2	8	0
A5	Abdul Malik	83	81	1	5	0
A6	Muhammad Fauzan Primary	87	86	1	6	0
A7	M. Pious	86	86	1	8	0
A8	Ibrahimsyah	88	85	0	20	0
A9	Sanna Aliya	87	89	0	20	6
A10	Novi Marlina	87	89	1	8	1
A11	Muhammad David Primary	86	86	1	20	0
A12	Flower Chelsye	87	87	1	10	0
A13	Hoiriah	87	90	2	8	2
A14	Juliana	83	83	0	7	2
A15	Ali Yakkup Payora	75	80	1	20	0
A16	Muhammad Angga Prayitno	89	88	2	30	12
A17	Nurbana	91	85	1	20	2
A18	Diana Marshahira	87	89	1	20	10
A19	House	86	87	1	25	0
A20	Juliana	83	83	0	10	2
A21	Graceful Oktarina	86	86	2	6	3
A22	Oki Lukman	85	88	0	15	11
A23	Dahlia	86	86	0	5	0

Table 3. Normalization

Code Alternative	Criteria				
	C1	C2	C3	C4	C5
A1	0.87	0.91	0	3	0
A2	80.94	80.95	0	1.6	0
A3	0.83	0.92	0.5	1.4	0
A4	0.94	0.95	1	1.6	0
A5	0.91	0.9	0.5	1	0
A6	0.95	0.95	10.5	1.2	0
A7	0.94	0.95	0.5	1.6	0
A8	0.90	0.94	0	4	0
A9	0.95	0.98	0	4	0.5
A10	0.95	0.98	0.5	1.6	0.08
A11	0.94	0.95	0.5	4	0
A12	0.95	0.96	0.5	2	0
A13	0.95	1	1	1.6	0.16
A14	0.91	0.92	0	1.4	0.16
A15	0.82	0.88	0.5	4	0
A16	0.97	0.97	1	6	1
A17	1	0.94	0.5	4	0.16
A18	0.95	0.98	0.5	4	0.83
A19	0.94	0.96	0.5	5	0
A20	0.91	0.92	0	2	0.16
A21	0.94	0.95	1	1.2	0.25
A22	0.93	0.97	0	3	0.91
A23	0.94	0.95	0	1	0

A. Preference Value

Determine mark Preference A1 Until with A23 is as following:

A1=	(0.87*0.30)+(0.91*0.25)+(0*0.15)+(3*0.10)+(0*0.20) =0.79
A2=	(80.94*0.30)+(80.95*0.25)+(0*0.15)+(1.6*0.10)+(0*0 .20)=0.68
A3=	(0.83*0.30)+(0.92*0.25)+(0.5*0.15)+(1.4*0.10)+(0*0. 20)=0.87
A4=	(0.94*0.30)+(0.95*0.25)+(1*0.15)+(1.6*0.10)+(0*0.2 0)=1.18
A5=	(0.91*0.30)+(0.9*0.25)+(0.5*0.15)+(1*0.10)+(0*0.20) =0.85
A6=	(0.95*0.30)+(0.95*0.25)+(10*0.15)+(1.2*0.10)+(0*0. 20)=0.90
A7=	(0.94*0.30)+(0.95*0.25)+(0*0.15)+(1.6*0.10)+(0*0.2 0)=0.93
A8=	(0.90*0.30)+(0.94*0.25)+(0*0.15)+(4*0.10)+(0*0.20) =0.93
A9=	(0.95*0.30)+(0.98*0.25)+(0*0.15)+(4*0.10)+(0.5*0.2 0)=1.03
A10=	(0.95*0.30)+(0.98*0.25)+(0.5*0.15)+(1.6*0.10)+(0.08 *0.20)=0.96
A11=	(0.94*0.30)+(0.95*0.25)+(0.5*0.15)+(4*0.10)+(0*0.2 0)=1.17
A12=	(0.95*0.30)+(0.96*0.25)+(0.5*0.15)+(2*0.10)+(0*0.2 0)=0.98
A13=	(0.95*0.30)+(1*0.25)+(1*0.15)+(1.6*0.10)+(0.16*0.2 0)=1.23
A14=	(0.91*0.30)+(0.92*0.25)+(0*0.15)+(1.4*0.10)+(0.16* 0.20)=0.68
A15=	(0.82*0.30)+(0.88*0.25)+(0.5*0.15)+(4*0.10)+(0*0.2 0)=1.12
A16=	(0.97*0.30)+(0.97*0.25)+(1*0.15)+(6*0.10)+(1*0.20) =1.84
A17=	(1*0.30)+(0.94*0.25)+(0.5*0.15)+(4*0.10)+(0.16*0.2 0)=1.22
A18=	(0.95*0.30)+(0.98*0.25)+(0.5*0.15)+(4*0.10)+(0.83* 0.20)=1.35
A19=	(0.94*0.30)+(0.96*0.25)+(0.5*0.15)+(5*0.10)+(0*0.2 0)=1.28
A20=	(0.91*0.30)+(0.92*0.25)+(0*0.15)+(2*0.10)+(0.16*0. 20)=0.74
A21=	(0.94*0.30)+(0.95*0.25)+(1*0.15)+(1.2*0.10)+(0.25*0 .20)=1.19

A22=	(0.93*0.30)+(0.97*0.25)+(0*0.15)+(3*0.10)+(0.91*0.20)=1.01
A23=	(0.94*0.30)+(86/90*0.25)+(0*0.15)+(110)+(0*.20)= 0.62

Table 4. Determination Ranking

Ranking	Name	Mark End
1	Muhammad Angga Prayitno	1.84
2	Diana Marshahira	1.35
3	House	1.28
4	Hoiriah	1.23
5	Nurbana	1.22
6	Graceful Oktarina	1.19
7	Heri Santoso	1.18
8	Muhammad iDafid iPratama	1.17
9	Ali iYakkup iPayora	1.12
10	Sanna iAliya	1.03
11	Oki iLukman	1.01
12	Flower Chelsye	0.98
13	Novi Marlina	0.96
14	M. Pious	0.93
15	Ibrahimsyah	0.93
16	Muhammad Fauzan Primary	0.90
17	Arifai	0.87
18	Abdul Malik	0.85
19	Muhammad Amen	0.79
20	Juliana	0.74
21	Muslim	0.68
22	Juliana	0.68
23	Dahlia	0.62

So, results from the ranking data can determine the number of students that can be accepted into Vocational School Country 1 Cape based on the order of marks that must be fulfilled. And if all candidate students' marks are fulfilled, selection will still be conducted based on the limited quota for student reception, in accordance with the order of ranking.

System Implementation

Following This is picture results implementation from S[K reception student new Vocational School Country 1 Cape pool

A. Page View From Login

Figure 1. Page From Login

This is results implementation page login SPK reception student new. Page login is page beginning on moment First time user using website. With enter username And password, Then login.

B. Page View on Dashboard

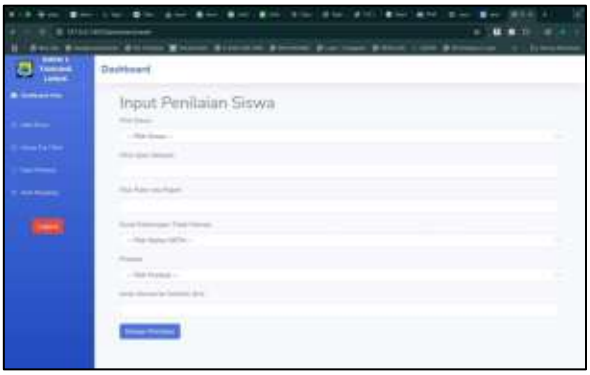

Figure 2. Page Dashboard

This is results implementation page dashboard SPK reception student new. Page dashboard is page main on website.

C. Student Data Page View

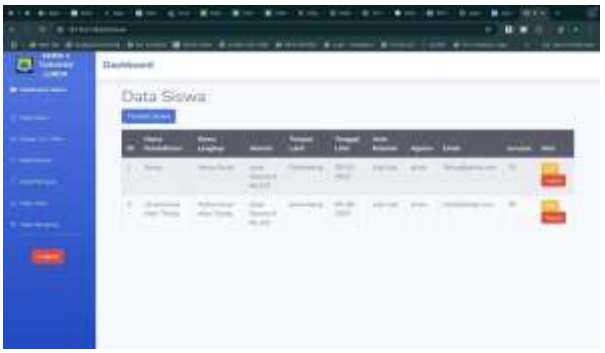

Figure 3. Page Data Student

This is results implementation page data student on SPK reception student new. Page data student is page Which containing place filling data student Which will register.

D. Add Student Data Page View

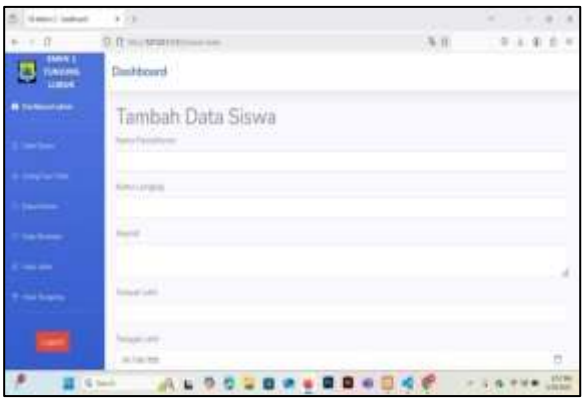

Figure 4. Page Plus Data Student

This is results implementation page plus data student on SPK reception student new. Page data student is page Which containing place addition data student Which will register.

E. Parent Data Page View

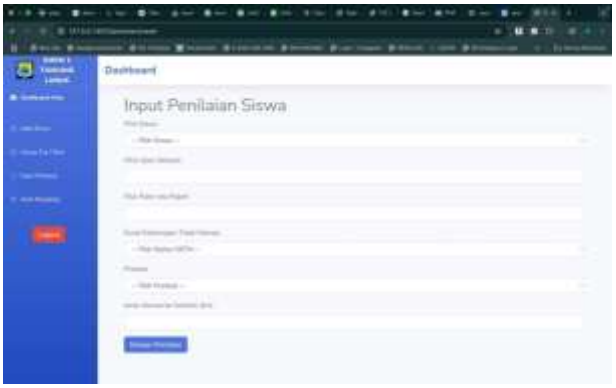

Figure 5..Page Data Person Old

This is results implementation page Data Person Old on SPK reception student new. Page Data Person Old is page Which containing data person old or guardian from candidate student Which register.

F. Add Parent Data Page View

This is results implementation page Plus Data Person Old on SPK reception student new. Page Plus Data Person Old is page Which containing place addition data person old or guardian from candidate student Which register.

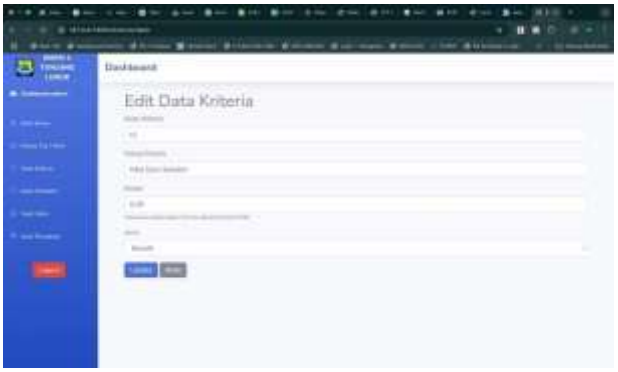

Figure 6. Page Plus Data Person Old

G. Criteria Data Page View

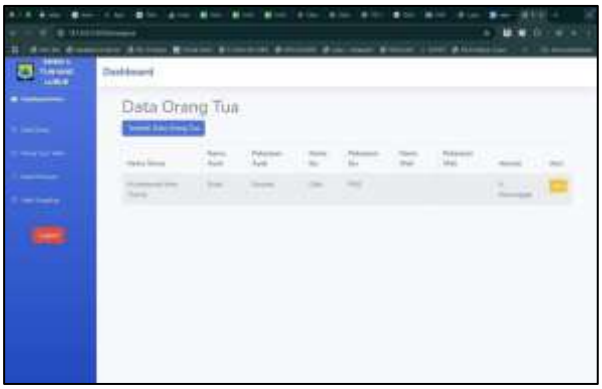

Figure 7. Page Plus Data Criteria

This is results implementation page data criteria evaluation on SPK reception student new. Page data criteria is page Which must in content by candidate student Which where criteria here is condition Which must they fulfill.

H. Add Criteria Data Page View

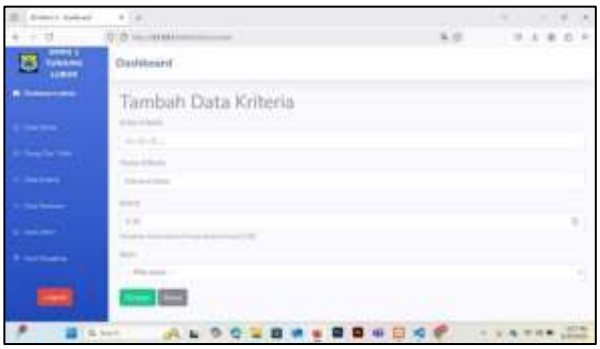

Figure 8. Page Plus Data Criteria

This is results implementation page addition data criteria evaluation on system supporters decision reception student new. Page data criteria is page Which must in content by candidate student Which where criteria here is condition Which must they fulfill.

I. Edit Criteria Data View

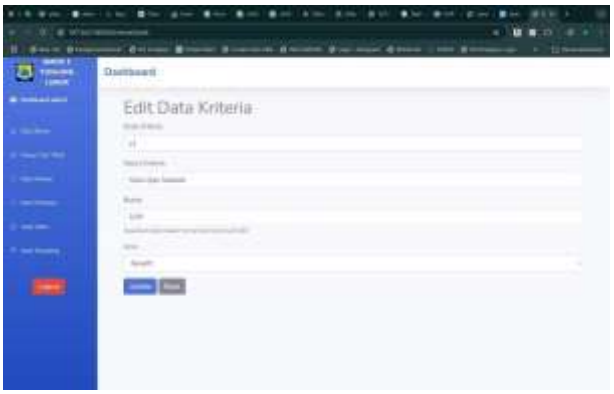

Figure 9. Page Edit Data Criteria

This is results implementation page Edit data criteria that is page Which Can change data related criteria Which will used.

J. Student Assessment Input Page View

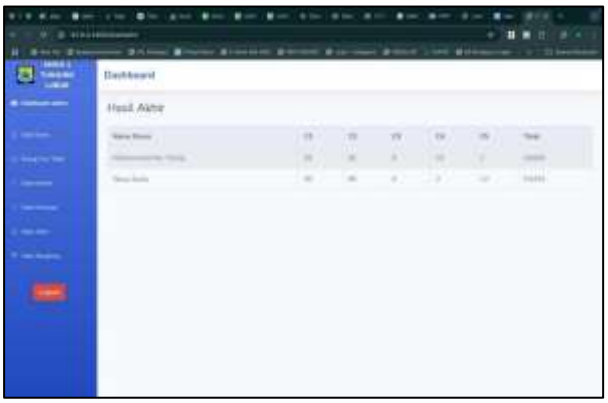

Figure 10. Page Input Evaluation Student

This is results implementation page input data student on system supporters decision reception student new. Page This is page Which containing data evaluation student.

K. Matrix Calculation View

This is results implementation calculation on program Which made with use method SAW.

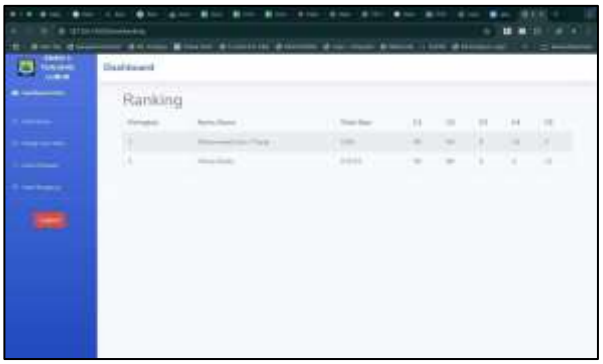

Figure 11. Page Appearance Calculation Matrix

L. Final Result View

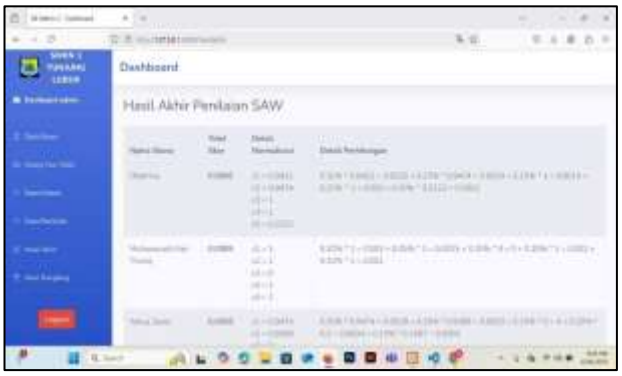

Figure 12. From Page Results End

This is results implementation page Results End on SPK reception student new. Page This is page Which display results score end from all over criteria Which has filled.

M. Page Ranking View

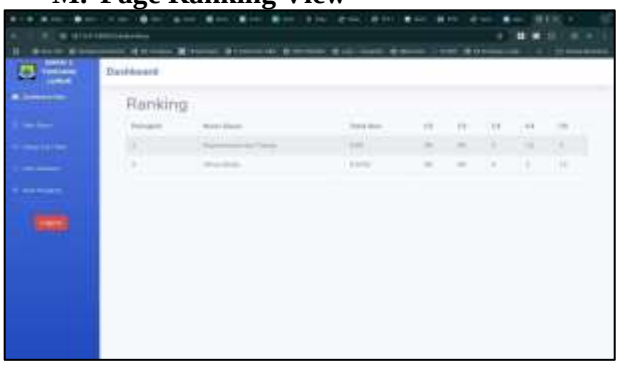

Figure 13. From Page Ranking

This is results implementation page Ranking on SPK reception student new Which where through ranking This We can know amount student Which later will accepted And can continue to stage test.

The following table presents the test results:

Table 5. Functional Testing Results of the SAW-Based New Student Admission Decision Support System

No.	Scenario Pengujian	Test Case	Input/Test Try	Expected Result	Results Testing
1	Pendaftaran	Candidate student fills in the registration form with complete and valid data.	Name, e-mail, password, and personal data.	Account successfully created, and a success message appears.	Account successfully created and registered.
2	Pendaftaran Account	Candidate student fills in the registration form with incomplete data.	One required field is empty or incorrect.	The system rejects the registration.	The system rejects the registration because the entered data are incomplete.
3	Login	Candidate student logs in with the correct username and password.	Valid username and password.	The student enters the dashboard, and a success message appears.	The dashboard page is successfully displayed.
4	Login	Candidate student logs in with the wrong username or password.	Incorrect username or password.	The system rejects the login and displays an error message.	The system rejects the login because the username or password is incorrect.
5	Input Data Mark	Student fills in report card marks and other supporting data.	School examination marks, average report card score, achievement, distance to school, KIP/PKH, etc.	The data are saved, and the message “Data successfully saved” appears.	The data are successfully saved.
6	Upload Document	Student uploads supporting documents, such as a photograph, birth certificate, etc.	Valid document files.	The documents are successfully uploaded, and a success message appears.	The documents are successfully uploaded.
7	Print Form	Student prints the registration form.	Click the print button.	The complete registration form appears and is ready to print.	The form is successfully printed.
8	Ranking Alternative	The system displays the student ranking results based on the SAW scores.	All participant data.	The ranking list appears, and accepted students are displayed according to their score order.	All participant data are successfully displayed according to the ranking order of the accepted students.

Supporters or (Support) or Maintenance (Maintenance)

For the future, there is no closed possibility that the software device will experience changes when it has already been sent to the user. This change can happen because there are errors that appear and were not detected at the moment of testing. In the support and maintenance stage, the development process can be repeated starting from the analysis specification phase to change the software device that already exists, but not to make a new software device from scratch.

5. Conclusion

This research successfully implemented a web-based decision support system using the Simple Additive Weighting (SAW) method for the selection of new student admissions at SMK Negeri 1 Tanjung Lubuk, with the main findings being an accurate ranking of 23 prospective students based on five main criteria, namely school exam scores (weighted 0.30), average report card scores (0.25), certificate of poverty (0.15), achievement (0.20), and distance to school (0.10). The system developed with the Waterfall model and the Laravel framework produces an efficient, transparent, and user-friendly automation process, starting from inputting student and parent data, to calculating the normalization matrix and preference values, thereby increasing the objectivity of selection compared to manual methods. Practical implications include ease of real-time access for school committees, reduction of calculation errors, and automatic ranking capabilities according to quotas, which can be replicated in similar educational institutions to support data-driven decision making.

However, the study's limitations lie in its limited sample size to a single school and purposive data, requiring broader testing to generalize the results. Furthermore, black-box testing does not yet address high server loads or integration with the national registration system. Suggestions for further research include developing a hybrid approach with Multi-Attribute Utility Theory for more complex qualitative criteria, adding mobile-responsive features, and evaluating the accuracy of post-selection student success predictions. This approach is expected to enrich the application of DSS in Indonesia's vocational education sector.

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