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Web-Based Student Activity Performance Assessment Decision Support System with AHP and WASPAS Methods

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ABSTRACT Student activity performance assessment is an important process in evaluating the success and effectiveness of activities carried out by students. However, subjective and unstructured assessment processes can lead to inaccurate and unfair results. Consequently, there is a necessity for a support system that can help in evaluating student performance in their activities in an objective and organized manner. This research focuses on creating an online system for evaluating student activity performance, utilizing the Analytical Hierarchy Process (AHP) and Weighted Aggregated Sum Product Assessment (WASPAS) techniques. The purpose of this system is to aid decision makers in measuring student activity performance according to established standards. The findings from the research show that the created decision support system can aid in evaluating student activity performance in an objective and organized way, enhancing both the precision and equity of the evaluation procedure. This system can also assist decision makers in making more precise and effective decisions in assessing student activity performance.

Keywords: Decision Support System, AHP, WASPAS, Student Performance, Activity Evaluation, Web-based Application

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Introduction

Zebua, Maya, and Sonata (2022) stated that performance assessment in an organization is crucial to assess the progress and effectiveness of existing human resources. This assessment procedure gives a straightforward insight into how well individuals and teams perform their tasks and obligations. This serves as a foundation for recognizing areas for growth and enhancement that can boost the organization's productivity and effectiveness in the future. Bahaudin Mudhary University of Madura (UNIBA Madura) aims to enhance educational standards as a higher learning institution, partly by developing effective Student Activity Units (UKM).

Student Activity Units (UKM) serve as a platform for learners to develop their skills, passions, and capabilities beyond traditional studies (Samiun, Abdullah and Sirajuddin, 2022). UKM is viewed as a crucial component in evaluating the quality of a higher education institution.. By participating in UKM, students can gain valuable experience that improves their quality, both in professional and educational aspects (Samiun et al., 2022). The criteria and indicators in UKM have a significance that cannot be ignored. This is very important for the sustainability of the UKM itself. Many organizations can operate well and sustainably because of the implementation of performance measurement based on scientific methods. This performance measurement functions as an evaluation tool that provides a clear picture for taking the right steps in achieving the desired goals, so that UKM or organizations can assess the extent to which the programs that have been prepared help them achieve their vision, mission, and goals.

Many institutions still collect and analyze data manually using Microsoft Excel, which results in less than satisfactory results, even the possibility of data loss, and the calculation of criteria values one by one which is time-consuming (Pradana and Bu'ulolo, 2021). This manual process is even carried out only from an individual perspective. In a decision-making system, it must be objective and must not only benefit one party (Khairani, Siregar, Handoko, Syahputri and Harahap, 2023).

This can cause difficulties in obtaining a proper and comprehensive understanding of an organization's performance. Therefore, the process of evaluating organizational performance can run more efficiently, effectively, and measurably if supported by a system that facilitates the process. In practice, SMEs are often assessed through the success of the events or activities they organize. Responses from outside parties have the ability to provide a clear picture of how well the organization's goals and vision can be achieved, and provide a more unbiased assessment than the internal views of SME members themselves. The participation of outsiders, such as event participants, can provide a different and more comprehensive perspective on the quality and impact of the activities carried out, thus opening up opportunities to obtain valuable input for future evaluations.

According to Zebua et al. (2022), traditional performance assessment without utilizing information systems to check data is considered inefficient because it takes a lot of time. Therefore, the researcher wants to conduct a study entitled "Web-Based Student Activity Unit Performance Assessment Decision Support System with AHP and WASPAS Methods".

METHODS

The techniques used in this study consist of recognizing the problem, gathering data, designing the system, analyzing the data, implementing the system, conducting system tests, validating the final results, and drawing conclusions.

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a. Problem Identification

This stage is carried out by finding and formulating problems that will later be raised as research topics.

b. Data Collection

This procedure is used to collect data or information needed to support the planned research.

c. Data Analysis and System Design

This method is utilized to outline the desired system needs, methods for data handling, and technical specifications of the system. The goal is to make the implementation process easier.

d. System Applied

To create a complete system, the system design from the previous stage will be implemented in the program code.

e. System Testing

The developed system will undergo testing to identify potential weaknesses. If the test results are not as expected, the researcher will return to the implementation stage and make adjustments or improvements to ensure that the system created meets the research objectives.

f. Final Result Validation Test

The aim of this examination is to assess the accuracy and consistency of the ultimate outcomes from the alternative ranking with the assistance of SPSS software.

g. Conclusion

This section explains the final results of the system implementation which contains statements or important points based on the analysis of the methods that have been carried out.

Web-Based System Design

This platform is created to be accessible online for different users, including managers, company administrators, and evaluation groups. Its key characteristics consist of

AHP Weighting Stages

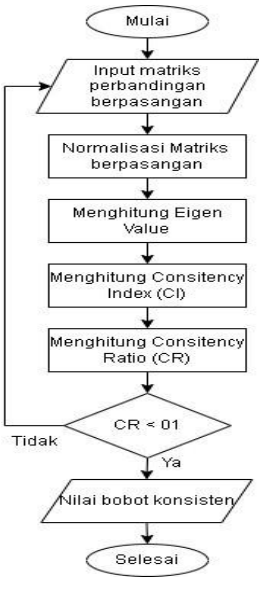

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Figure 1. AHP Stages

WASPAS Method Stages

Figure 2. WASPAS Stages

The technologies used include:

• **Database**: MySQL, a well-known relational database management system that is extensively utilized for creating web applications and more, or by employing PostgreSQL, a strong and favored relational database management system.).

Results and Discussion

In the System Implementation section, it is the stage of implementing the design and analysis of system requirements that have been done previously. The first step is to create a database, which in this study uses MySQL. Furthermore, the system programming uses Laravel, which is then connected to the database that has been created to send and store data. Once completed, the system is tested whether it has run as desired or not.

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The outcome of this project is an online decision aid tool to evaluate the effectiveness of various student activity groups at Bahaudin Mudhary University Madura, utilizing the evaluation form included in the system. In this case, as explained in the research limitations, the UKMs assessed are only UKM Olahraga, Pramuka, Sanggar Dhemar, E-Sport, and English Speaking Club (ESC). The criteria weighting uses the AHP method, where the value has been set in the system programming, meaning that the weight value cannot be changed. Meanwhile, the performance calculation uses the WASPAS method which will produce UKM performance values as well as alternative rankings.

Table 1. Authentication Testing

No	Test Features	Test Conditions	Expected results	Testing Results
		does not match, or the password does not reach the minimum of 8 characters	error message	
		Registration is successful if the requirements are met.	*User enters the page home in the system*	
2	*Login*	*Login fails if the form is left blank, or the email/password entered is not registered in the database.*	*The user is still on the sign-in page while the system shows an error notification.*	Succeed
		Login is successful if the email and password entered match those registered in the database.	*The individual accesses the main page of the platform.*	

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3	*Forgot Password*	*Password recovery fails if the email entered is not registered in the database.*	The system failed to send the password recovery link via e-mail.	Succeed
		Password recovery is successful if the email entered is registered in the database.	The system sends a password recovery link via e-mail and the user can update his/her password.	

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Table 2. Admin Feature Testing

No	Test Features	Test Conditions	Expected results	Testing Results
1	*View Dashboard*	Click the dashboard button	The system displays the dashboard page and the information in it.	Succeed
2	Add User Data	Failed to add user if email format is not correct, password does not reach minimum 8 characters, or form is left blank	The system shows a message indicating an error.	succeed
		Successfully add user if all formats are correct	*User was added successfully and is now visible in the user data table.*	
3	Delete User Data	Click the delete button	The system displays a confirmation dialog asking whether you are sure to delete or not.	Succeed
4	Edit User Data	Failed to edit user data if the email format is incorrect, or the form is left blank	The system displays an error message	Succeed
		Successfully edit user data if the email format is correct	User data has been successfully changed	

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5	*View SME Data*	View SME data details	Displays detailed UKM data consisting of UKM name, e-mail, telephone, name	Succeed
			administrators, and description of SMEs	
6	Add Student Activity Unit Data	Failed to add UKM if the email/telephone format is not correct, or the form is left blank	The system shows a notification indicating an error.	Succeed
		Successfully add SME if all formats are correct	UKM was added successfully and can be found in the UKM data table.	
7	Delete Student Activity Unit Data	Click the delete button	The system displays a confirmation dialog asking whether you are sure to delete or not.	Succeed
8	Edit Student Activity Unit Data	Failed to edit UKM data if the email/password format is incorrect or the form is left blank	The system displays an error message	Succeed
		Successfully edit UKM data if the email format is correct	UKM data successfully changed	

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9	*View Event Data*	View detailed event data	Displays event data details consisting of event details and assessment results.	Succeed
10	Add Event Data	Failed to add event if form exists empty	The system displays an error message	Succeed
11	Delete Event Data	Click the delete button	The system displays a confirmation dialog asking whether you are sure to delete or not.	Succeed
12	Edit Event Data	Failed to edit event data if any form is left blank	The system displays an error message	Succeed
		Successfully edit event data if the email format is correct	UKM data successfully changed	
13	*View Assessment Criteria Data*	View detailed assessment criteria data	Displays the assessment criteria and their weighting, as well as a list of SME assessment questions	Succeed
14	Add Criteria Question	Failed to add question data if form is blank	The system displays an error message	Succeed
		Successfully added question data if the format is correct	New question added successfully	

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15	Delete Data Criteria Assessment	Click the delete button	The system displays a confirmation dialog asking whether you are sure to delete or not.	Succeed
16	Edit Question Criteria	Failed to edit question if any form is left blank	The system displays an error message	Succeed
17	*View Performance Results Data*	View detailed assessment data results	Displaying the results data in the form of WASPAS calculations and rankings from UKM performance assessments	Succeed
18	Edit Profile	Failed to edit profile data if there is an empty form	The system displays an error message	Succeed
		Successfully edited profile data if the format is correct	Profile data successfully changed	

Table 3 Testing of Administrator Features

No	Test Features	Test Conditions	Test Conditions	Testing Results
1	*View Dashboard*	Click the dashboard button	The system displays the dashboard page and the information in it.	Succeed

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2	*View SME Data*	View SME data details	Displays detailed UKM data consisting of UKM name, e-mail, telephone, administrator name, and UKM description.	Succeed
3	Edit SME Data	Failed to edit UKM data if the email/password format is incorrect or the form is left blank	The system displays an error message	Succeed
4	*View Event Data*	View SME data details	Displays event data details consisting of event details and assessment results.	Succeed
5	Add Event Data	Failed to add event if any form is blank	The system displays an error message	Succeed
		Successfully added event if all formatssesuai	The event is postponed until validation from the admin.	
6	Delete Event Data	Click the delete button	The system displays a confirmation dialog asking whether you are sure to delete or not.	Succeed
	Edit Event Data	Failed to edit event data if any form is left blank	The system displays an error message	Succeed

7		Successfully edit event data if the email format is correct	UKM data successfully changed	
8	*View Assessment Criteria Data*	View detailed assessment criteria data	Displays the assessment criteria and their weighting, as well as a list of SME assessment questions.	Succeed
9	Edit Profile	Failed to edit profile data if there is an empty form	The system displays an error message	Succeed
		Successfully edited profile data if the format is correct	Profile data successfully changed	

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Table 4. User Feature Testing

No	Test Features	Test Conditions	Expected results	Testing Results
1	*View* UKM	View SME data details	Displays detailed UKM data consisting of name, e-mail, telephone, administrator name, and UKM description.	Succeed
2	Event Listing	Event registration fails if the form is left blank or the phone format is incorrect.	The system displays an error message	Succeed
		Successfully register an event if all formats are correct	The system displays a success message	
3	Assessment Form	Failed to provide assessment if the assessment session has not been opened	The system displays a message that the assessment session has not been opened.	Succeed
		Provide an assessment of UKM for the events they have attended	Fill out the assessment form with the questions and scoring options provided.	
4	Edit Profile	Failed to edit profile data if there is an empty form	The system displays an error message	Succeed
		Successfully edit profile data if the format is correct	Profile data has been successfully changed	

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In this study, researchers took several UKMs as alternatives, namely UKMs that participated in the 2024 UNIBA Festival from 1 to 15 June 2024. Therefore, the following data was obtained.

Table 5. Participant data

Nama UKM	**Acara**	**Total Pengisian *Form* Penilaian**
*English Speaking Club (*ESC)	*Smart English Competition* 2024	44
E-Sport	*Mobile Legend Turnament*	17
Sanggar Dhemar	Seni Rupa 2D	23
Olahraga	UNIBA *Volleyball Cup 2024*	31
	UNIBA Futsal *Cup* 2024	25
Pramuka	UNIBA *Scout Fest* III 2024	18
Total		158 orang

"The following is the calculation involving 5 alternatives:
A1: English Speaking Club (ESC)
A2: E-Sports
A3: Sanggar Dhemar
A4: Sports
A5: Scouts**"**

The steps involved in applying the WASPAS method to the system are as follows:

a. Developing a decision matrix derived from the average scores provided by participants, which will enable:

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Matriks Keputusan

UKM	C1	C2	C3	C4	C5
English Speaking Club (ESC)	3.417	3.455	3.705	3.538	3.424
E-Sport	3.333	3.353	3.255	3.275	3.196
Sanggar Dhemar	3.29	3.433	3.289	3.537	3.276
Olahraga	3.463	3.35	3.061	3.303	3.302
Pramuka	3.408	3.501	3.184	3.427	3.297

Figure 3. Decision matrix results

a. Normalization of the decision matrix where the criteria are benefits.

Normalisasi Matriks

UKM	C1	C2	C3	C4	C5
English Speaking Club (ESC)	0.987	0.987	1	1	1
E-Sport	0.962	0.958	0.879	0.926	0.933
Sanggar Dhemar	0.95	0.981	0.888	1	0.957
Olahraga	1	0.957	0.826	0.933	0.964
Pramuka	0.984	1	0.859	0.969	0.963

Figure 4. Matrix normalization results

b. Calculate the Qi value by adding the weighted sum and weighted product (WSM and WPM)

Weighted Sum Model (WSM)

UKM	C1	C2	C3	C4	C5	Total	Hasil
English Speaking Club (ESC)	0.408	0.254	0.154	0.088	0.088	0.991	0.496
E-Sport	0.397	0.246	0.135	0.081	0.082	0.942	0.471
Sanggar Dhemar	0.392	0.252	0.137	0.088	0.084	0.953	0.477
Olahraga	0.413	0.246	0.127	0.082	0.085	0.953	0.477
Pramuka	0.406	0.257	0.132	0.085	0.085	0.966	0.483

Figure 5. Qi WSM Results

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Weighted Product Model (WPM)

UKM	C1	C2	C3	C4	C5	Total	Hasil
English Speaking Club (ESC)	0.994	0.997	1	1	1	0.991	0.496
E-Sport	0.984	0.989	0.98	0.993	0.994	0.942	0.471
Sanggar Dhemar	0.979	0.995	0.982	1	0.996	0.953	0.476
Olahraga	1	0.989	0.971	0.994	0.997	0.951	0.476
Pramuka	0.993	1	0.977	0.997	0.997	0.964	0.482

Figure 6. Qi WPM Results

So that the Qi value is obtained as the final result as follows:

Hasil Akhir (Qi)

10 entries per page Search...

Rank	UKM	Nilai Qi
1	English Speaking Club (ESC)	0.991
2	Pramuka	0.965
3	Sanggar Dhemar	0.953
4	Olahraga	0.952
5	E-Sport	0.942

Figure 7. Final result of Qi

From the data results, it can be concluded that what influences the final ranking of UKM. First, the number of participants does not have a significant effect on the final ranking because the calculation starts from the decision matrix obtained from the average value of respondents. This means that the quality of the assessment is prioritized over the quantity of participants. However, the number of UKM events can affect the final ranking. If a UKM holds more than one event, then the final score is the average of each event. This means that the performance of UKM at each event can have an impact on the final ranking, so UKM needs to ensure that each event runs well. In addition, the assessment criteria also have a major influence on the final ranking. Criteria with higher weights have a greater influence in determining the ranking, so UKM administrators need to pay more

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attention to this aspect in event planning to increase the chances of getting a better ranking. Thus, UKM can focus more on improving the quality of the event and meeting the assessment criteria that have high weights.

Validity and reliability tests in this study were conducted to test the quality of data obtained from the assessment of event participants towards SMEs through the assessment g-form, so that the final results/values produced by the system can be said to be valid and reliable.

Based on the test results conducted with SPSS, obtained:

a. All calculated r values > r table

b. All significance values < 0.05

c. Cronbach's Alpha value > 0.60

Thus, it can be concluded that the final results obtained are valid and reliable. The following are the results of validity and reliability tests using SPSS:

		P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	P11	P12	P13	P14	P15	TOTAL
P01	Pearson Correlation	1	.351**	.415**	.436**	.264**	.381**	.430**	.386**	.393**	.345**	.423**	.342**	.492**	.387**	.417**	.635**
	Sig. (2-tailed)		0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P02	Pearson Correlation	.351**	1	.421**	.280**	.261**	.253**	0.110	.166*	0.103	.184*	.212**	.173*	.371**	.335**	.382**	.460**
	Sig. (2-tailed)	0.000		0.000	0.000	0.001	0.001	0.168	0.037	0.199	0.021	0.007	0.030	0.000	0.000	0.000	0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P03	Pearson Correlation	.415**	.421**	1	.371**	.308**	.296**	.296**	.372**	.336**	.316**	.356**	.426**	.361**	.435**	.386**	.600**

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	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P04	Pearson Correlation	.436**	.280**	.371**	1	.457**	.470**	.367**	.385**	.447**	.429**	.479**	.443**	.482**	.420**	.544**	.696**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P05	Pearson Correlation	.264**	.261**	.308**	.457**	1	.522**	.246**	.246**	.332**	.290**	.343**	.321**	.440**	.519**	.527**	.609**
	Sig. (2-tailed)	0.001	0.001	0.000	0.000		0.000	0.002	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P06	Pearson Correlation	.381**	.253**	.296**	.470**	.522**	1	.441**	.381**	.380**	.510**	.472**	.401**	.567**	.545**	.574**	.721**
	Sig. (2-tailed)	0.000	0.001	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P07	Pearson Correlation	.430**	.110	.296**	.367**	.246**	.441**	1	.711**	.586**	.502**	.497**	.317**	.591**	.415**	.407**	.692**
	Sig. (2-tailed)	0.000	0.168	0.000	0.000	0.002	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P08	Pearson Correlation	.386**	.166*	.372**	.385**	.246**	.381**	.711**	1	.709**	.416**	.467**	.363**	.595**	.431**	.391**	.705**

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	Sig. (2-tailed)	0.000	0.037	0.000	0.000	0.002	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P09	Pearson Correlation	.393**	0.103	.336**	.447**	.332**	.380**	.586**	.709**	1	.417**	.393**	.412**	.514**	.374**	.345**	.677**
	Sig. (2-tailed)	0.000	0.199	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P10	Pearson Correlation	.345**	.184*	.316**	.429**	.290**	.510**	.502**	.416**	.417**	1	.526**	.422**	.492**	.410**	.431**	.662**
	Sig. (2-tailed)	0.000	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P11	Pearson Correlation	.423**	.212**	.356**	.479**	.343**	.472**	.497**	.467**	.393**	.526**	1	.573**	.518**	.395**	.471**	.705**
	Sig. (2-tailed)	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P12	Pearson Correlation	.342**	.173*	.426**	.443**	.321**	.401**	.317**	.363**	.412**	.422**	.573**	1	.449**	.363**	.349**	.624**
	Sig. (2-tailed)	0.000	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P13	Pearson Correlation	.492**	.371**	.361**	.482**	.440**	.567**	.591**	.595**	.514**	.492**	.518**	.449**	1	.549**	.534**	.792**
	Sig. (2-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0

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	tailed)	00	00	00	00	00	00	00	00	00	00	00	00		00	00	00
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P14	Pearson Correlation	.387**	.335**	.435**	.420**	.519**	.545**	.415**	.431**	.374**	.410**	.395**	.363**	.549**	1	.669**	.723**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
P15	Pearson Correlation	.417**	.382**	.386**	.544**	.527**	.574**	.407**	.391**	.345**	.431**	.471**	.349**	.534**	.669**	1	.742**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.000
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158
TOTAL	Pearson Correlation	.635**	.460**	.600**	.696**	.609**	.721**	.692**	.705**	.677**	.662**	.705**	.624**	.792**	.723**	.742**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
	N	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158	158

Figure 8. Validity test

Case Processing Summary			
		N	%
Cases	Valid	158	100.0
	Excluded[a]	0	0.0
	Total	158	100.0
Reliability Statistics			

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Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items	
0.911	0.912	15	

Figure 9. Reliability test

This comparison is to show how accurate the final results obtained by the system with manual calculations using Excel. Here are the results of manual calculations:

Table 6. Manual decision matrix

Decision Matrix	C1	C2	C3	C4	C5
ESC	3.417	3.455	3.705	3.538	3.424
E-SPORT	3.333	3.353	3.255	3.275	3.196
DHEMAR DRAWING STUDIO	3.290	3.435	3.290	3.536	3.275
SPORT	3.463	3.350	3.061	3.303	3.303
SCOUT	3.407	3.500	3.185	3.426	3.296

Table 7. Manual normalization

Normalization	C1	C2	C3	C4	C5
ESC	0.987	0.987	1.000	1.000	1.000
E-SPORT	0.962	0.958	0.879	0.926	0.933
DHEMAR DRAWING STUDIO	0.950	0.981	0.888	1.000	0.957
SPORT	1.000	0.957	0.826	0.934	0.965

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SCOUT	0.984	1.000	0.860	0.968	0.963

Table 8. Manual Qi WSM results

WSM	C1	C2	C3	C4	C5	Total	Hasil
ESC	0.407	0.254	0.154	0.088	0.088	0.991	0.496
E-SPORT	0.398	0.246	0.135	0.081	0.082	0.943	0.471
DHEMAR DRAWING STUDIO	0.392	0.252	0.137	0.088	0.084	0.953	0.477
SPORT	0.413	0.246	0.127	0.082	0.085	0.953	0.477
SCOUT	0.406	0.257	0.132	0.085	0.085	0.966	0.483

Table 9. Qi WPM manual results

WPM	C1	C2	C3	C4	C5	Total	Hasil
ESC	0.994	0.997	1.000	1.000	1.000	0.991	0.496
E-SPORT	0.984	0.989	0.980	0.993	0.994	0.942	0.471
DHEMAR DRAWING STUDIO	0.979	0.995	0.982	1.000	0.996	0.953	0.476
SPORT	1.000	0.989	0.971	0.994	0.997	0.951	0.476
SCOUT	0.993	1.000	0.977	0.997	0.997	0.964	0.482

Table 10. Final results of manual Qi

Alternative	Nilai Qi	Ranking
ESC	0.991	1
SCOUT	0.965	2
DHEMAR	0.953	3

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DRAWING STUDIO		
SPORT	0.952	4
E-SPORT	0.942	5

Table 11. Accuracy Comparison

Below is a comparison chart displaying the ultimate outcomes derived from both the system and manual computations, achieved with a precision rate of 100 percent:

Alternatif	**UKM**	***Excel***	**Rank**	**Qi Value**	**Suitability**
		Nilai Qi		**System**	
A1	ESC	0.991	1	0.991	Sesuai
A2	*E-Sport*	0.942	5	0.942	Sesuai
A3	Sanggar Dhemar	0.953	3	0.953	Sesuai
A4	Olahraga	0.952	4	0.952	Sesuai
A5	Pramuka	0.965	2	0.965	Sesuai

To calculate the level of accuracy, the following formula is used (Eko & Purnomo, 2024):

$$\text{Accuracy} = \frac{N}{Nts} \; x \; 100\% \quad \text{.....(1)}$$

Description:

Ns: Same value

Nts: Different values So we get

$$\text{accuracy} = \frac{Ns}{Nts}$$

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$$\frac{x}{100\%} = \frac{5}{x}$$

$$\frac{100\%}{} = 100\%$$

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Information :

Ns : Same value

Nts : value

not the same So it is obtained

accuracy = $\text{Ns} = \frac{5}{Nts} \times 100\%$

= 100%

Conclusion

The application of AHP and WASPAS methods for web-based SME performance assessment at UNIBA Madura is able to produce alternative rankings to determine which SMEs have the best to the worst performance. The WASPAS approach has demonstrated its capability to tackle problems involving multiple criteria, while AHP can help establish consistent weights for those criteria. Combining decision support systems with online information systems can enhance efficiency in responding to changes in data over traditional manual processing.

The findings from this research indicate that the quantity of participants does not influence the ultimate ranking. However, the total number of events in a UKM and the scores achieved on high or low weighted criteria can alter the final ranking.. The SPK built is able to achieve an accuracy level of 100% compared to manual calculations.

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References

Abandika, S. A. (2022). Sistem Penunjang Keputusan Penerimaan Karyawan Administrasi Rumah Sakit Syekh Yusuf Gowa Menggunakan Metode AHP. *Buletin Sistem Informasi Dan Teknologi Islam*, *3*(2), 96–105.

Asdini, D., Khairat, M., & Utomo, D. P. (2022). Sistem Pendukung Keputusan Penilaian Kinerja Manajer di PT. Pos Indonesia dengan Metode WASPAS. *JURIKOM (Jurnal Riset Komputer)*, *9*(1), 41–47. https://doi.org/10.30865/jurikom.v9i1.3767

Eko, A. M. M. W., & Purnomo, A. S. (2024). Sistem Pendukung Keputusan Penerima Bantuan Langsung Tunai Menggunakan Metode Weighted Aggregated Sum Product Assesment (WASPAS) (Studi Kasus Desa Bukit Makmur). *Jurnal Mahasiswa Teknik Informatika*, *8*(1). https://ejournal.itn.ac.id/index.php/jati/article/view/8950/5177

Firmandi, T. (2019). *Memodelkan Aplikasi Akuntansi Menggunakan UML di Toko Obat Sumber Sehat Ciputat* [Universitas Islam Negeri Syarif Hidayatullah]. https://repository.uinjkt.ac.id/dspace/bitstream/123456789/45476/1/TIRTO%20FIR MANDI-FEB.pdf

Husada, F. R. K. (2019). *Implementasi Framework Laravel Untuk Membangun Sistem Administrasi Pembayaran Air Pada PPAB Perum Dolog Dengan Metode Waterfall* [Universitas Semarang]. https://repository.usm.ac.id/files/skripsi/G21A/2014/G.211.14.0060/G.211.14.0060- 15-File-Komplit-20190906104644.pdf

Janna, N. M., & Herianto. (2021). *Konsep Uji Validitas Dan Reliabilitas Dengan Menggunakan SPSS*. https://osf.io/preprints/osf/v9j52.

Kaharuddin, R. (2019). *Efektivitas Penilaian Mahasiswa Melalui Kuesioner Terhadap Kinerja Dosen Fakultas Ekonomi Dan Ilmu-Ilmu Sosial Universitas Fajar Makassar* [Universitas Fajar].

Karo Karo, P., & Nur, A. (2022). Pengaruh Kualitas Event Terhadap Kepuasan Peserta Pada Authenticity Silverspace Turnamen E-Sports Palembang. *Journal of Hospitality & Tourism Innovation*, *6*(2), 35–50. www.indopos.co.id,

Khairani, M., Siregar, Y. S., Handoko, D., Syahputri, N. I., & Harahap, H. (2023). Sistem Pendukung Keputusan Metode Waspas Dan Topsis Dalam Menentukan Dosen Terbaik Berdasarkan Variabel Bidang Keahlian. *Digital Transformation Technology (Digitech)*, *3*(1), 258–269. https://doi.org/10.47709/digitech.v3i1.2761

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DOI:

Lubis, A. H., Khairina, N., & Riandra, M. F. (2023). Comparison between Multiple Attribute Decision Making Methods through Objective Weighting Method in Determining Best Employee. *International Journal of Innovative Research in Computer Science and Technology*, *11*(2), 50–57. https://doi.org/10.55524/ijircst.2023.11.2.10

Lukita, C., Nas, C., & Ilham, W. (2019). Analisis Pengambilan Keputusan Penentuan Prioritas Utama Dalam Peningkatan Kualitas Mata Pelajaran Dengan Menggunakan Metode Perbandingan WASPAS dan MOORA. *Jurnal Nasional Teknologi Dan Sistem Informasi*, *5*(3), 130–137. https://doi.org/10.25077/TEKNOSI.v5i3

Perdana, F. R., Athallah, G., & Rosyani, P. (2023). Comparison of Copras, Vikor, and Waspas Methods in School Promotion Media Selection. *International Journal of Integrative Sciences*, *2*(12), 1951–1966. https://doi.org/10.55927/ijis.v2i12.7234

Pradana, A., & Bu'ulolo, E. (2021). Sistem Pendukung Keputusan Dalam Menilai Kinerja Tenaga Pendidikan Terbaik Menggunakan Metode WASPAS. *Konferensi Nasional Teknologi Informasi Dan Komputer*, *5*(1), 168–170. https://doi.org/10.30865/komik.v5i1.3666

Purwanto, I. (2023). Analisa Penerapan Metode WASPAS Dalam Sistem Pendukung Keputusan Penilaian Kinerja Checker Terbaik Pada Kereta Api. *Bulletin of Computer Science Research*, *3*(6), 392–399. https://doi.org/10.47065/bulletincsr.v3i6.287

Samiun, S. A. H., Abdullah, S. Do, & Sirajuddin, H. K. (2022). Sistem Informasi Pengelolaan Kegiatan UKM di Lingkungan Universitas Khairun Ternate Berbasis Web. *Media Elektrika*, *15*(1).

Soleha, U., Widyastuti, M., & Mustakim. (2021). *Perbandingan Algoritma Analytic Hierarchy Process (AHP), SMARTER, dan MOORA dalam Penentuan Bidang Keahlian Siswa*.

Sudipa, I. G. I., & Puspitayani, I. A. D. (2019). Analisis Sensitivitas AHP-SAW dan ROC-SAW dalam Pengambilan Keputusan Multikriteria. *International Journal of*