IMPLEMENTATION ANALYTICAL HIERARCHY PROCESS AND WEIGHTED PRODUCT METHOD FOR LOVEBIRD SELECTION IDENTIFICATION APPLICATIONS

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Abstrak

Diantara banyaknya jenis burung di Indonesia burung lovebird adalah hewan peliharaan yang paling banyak menarik perhatian dan menjadi favorit di kalangan masyarakat. Hal ini dibuktikan dengan sekian banyaknya komunitas pencinta lovebird di seluruh penjuru Indonesia. Permasalahan yang ada bagi orang awam yang kurang paham tentang dunia hewan dan memiliki pengetahuan yang sedikit mengenai bagaimana kualitas burung lovebird tersebut, tidak jarang kendalanya ialah dalam berbisnis bagi penjual sulit untuk memilih keputusan dalam mengatasi masalah pemilihan burung terbaik. Atas permasalahan tersebut penulis melakukan perbandingan kombinasi metode analytical hierarchy process dan weighted product dengan analytical hierarchy process dan TOPSIS dari perbandingan tersebut diperoleh nilai tertinggi sebesar 392.63 pada analytical hierarchy process dan weighted product untuk aplikasi perancangan aplikasi rekomendasi seleksi lovebird berkualitas terbaik berbasis website. Dari hasil pengujian aplikasi maupun perhitungan manual dengan 64 data sampel disimpulkan 4 pengguna atau sekitar 6% masuk pada kategori ketepatan rendah dalam hasil perekomendasian lovebird terbaik, 12 pengguna atau sebesar 19% dari seluruh total pengujian dinyatakan pada dengan tingkat kategori ketepatan sedang dalam hasil perekomendasian lovebird terbaik dan 48 pengguna atau sebesar 75% dari seluruh total pengujian dinyatakan pada dengan tingkat kategori ketepatan tinggi dalam hasil perekomendasian lovebird terbaik dengan nilai ketepatan tertinggi sebesar 80.2% pada jenis lovebird Albino.

Kata kunci: Sistem Pendukung Keputusan, Lovebird,, Berkualitas, Kombinasi, AHP, WP

Abstract

Among the many types of birds in Indonesia, lovebirds are pets that attract the most attention and become a favorite among the public. This is evidenced by the many communities of lovebird lovers throughout Indonesia. The problem that exists for ordinary people who do not understand the animal world and have little knowledge about the quality of the lovebirds, it is not uncommon for the problem to be in doing business for sellers it is difficult to make decisions in overcoming the problem of selecting the best birds. Based on this problem, the author compares the combination of the analytical hierarchy process and weighted product methods with the analytical hierarchy process and TOPSIS from this comparison, the highest score is 392.63 on the analytical hierarchy process and weighted product for the best quality web-based lovebird selection recommendation application design application. From the results of application testing and manual calculations with 64 sample data, it was concluded that 4 users or about 6% were included in the low accuracy category in the best lovebird recommendation results, 12 users or 19% of the total tests were stated at a moderate level of accuracy in the lovebird recommendation results. The best and 48 users or 75% of the total tests were stated at the high accuracy category level in the best lovebird recommendation results with the highest accuracy value of 80.2% on the Albino lovebird type.

Keywords: Decision Support System, Lovebird, Quality,Combination, AHP, WP

INTRODUCTION

Lovebirds are currently kept by many people because they have a melodious chirping sound and beautiful color gradations in the appearance of their feathers. The various types of lovebird names and their criteria are very unique and varied, so that they affect the price on the market every year depending on the season and the physical quality of the lovebird. Cases of problems in the system to be built are interrelated.

The type of poultry that is in demand on the market in the livestock category at this time is the lovebird. So that the interest from buyers who are looking for and buying the bird is very high. This of course requires the shop owner to understand the quality of good birds to sell to buyers. The problem is from the side of the seller who is still new to the business in the pet sector. The offer of a bird provider from a supplier is often rejected by the seller because it avoids the risk of loss due to not understanding the quality of a good lovebird for sale. The loss that occurred was that they had experienced fraud against the condition of the bird which was in fact unhealthy and imperfect, and in the end it affected income so that turnover decreased. As a result, the seller decided to stop selling lovebirds, to help the seller's decision problem in making it easier to choose a quality lovebird, a decision support system was made that can be used so as to increase buyer satisfaction.

The research which in this case discusses the selection of pigeons that has been carried out previously in 2021 by A.Ramadhan et al., namely the application produced is very user friendly and the admin or user does not find it difficult to determine the best quality of pigeons with the conclusion of determining the highest ranking alternative of 0.327 in system(Ramadhan, Suprianto, Surmarno, & Dijaya, 2021).

Other research is still on the same topic, namely the recommendation for selecting different types of chirping birds in 2019 by R.Rudiantoro et al by testing several different bird species to find out which sings best and the final result shows the highest preference value of 6.34 for the lovebird species.(Rudiantoro, Cholissodin, & Dewi, 2019).

In a further study regarding similar research objects in 2019 conducted by S. Bahtiar et al, namely lovebirds, which aims to assist the judges in objectively assessing the best bird competition contest. The output generated by computerization and manual calculation is the same with the highest value reaching 1.85(Bahtiar, Gunawan, Safii, & Parlina, 2019).

The next similar research conducted by E.L Amalia et al in 2019 was about determining in choosing the most superior lovebird in the competition. Application with a combination of AHP and TOPSIS methods (Amalia, RDA, & Pratama, 2019). The system is made to determine the best quality in determining the assessment in decision making in the competition so that it can help the judges with an accuracy rate of 98% system with manual calculations.

Then further research is still using the same method but with a different title for the discussion in 2021 conducted by S. Defit et al., discussing a system that identifies the quality of a wallet bird's nest with the application of the weighted product method. The results of this system show the ranking data well with an accuracy level reaching 100% according to manual calculations and applications(Defit, Nurcahyo, Studi, & Ilmu, 2021).

However, research related to the selection of lovebirds and using a combination of analytical hierarchy process and weighted product on the same issue has not been found before. For this reason, the author proposes a combination of analytical hierarchy process and weighted product methods in this study regarding a recommendation system for selecting quality lovebirds that can be used by ordinary people, especially bird sellers to determine good quality for sale to buyers. The selection of the AHP and WP methods was based on the results of the comparison test of the combination of these methods with other methods, namely the analytical hierarchy process and the technique for others reference by similarity to ideal solution (TOPSIS)(Amalia et al., 2019) using the Mean Squared Error (MSE) forecasting model to find out which method is the best (Sugianto, Roslina, & Situmorang, 2021). The final result shows the highest value in the AHP-WP combination, which is 392.63, it can be concluded that the AHP-WP method is the best and most accurate method of research in determining the selection of quality lovebirds. It is hoped that with this decision support system in the application of recommendations for determining quality lovebirds, it can overcome decisions in choosing which types meet the good quality of lovebirds precisely and accurately.

RESEARCH METHODS

The stages of research are carried out so that the plan can be neatly arranged and get maximum results.

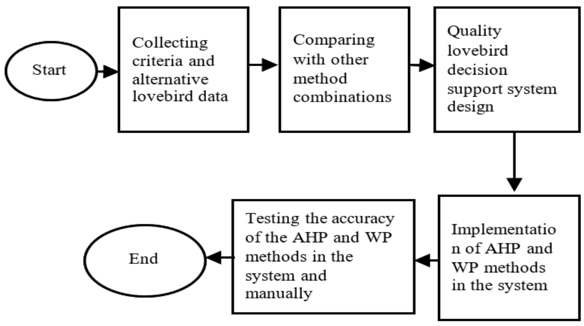

Figure 1. Research Framework

Figure 1 describes the framework of the stages in the preparation of this research, starting with collecting data on criteria and alternative lovebirds, then comparing the combination of methods used with other combination methods, then making a system design after applying the AHP and WP methods into the system and finally doing testing. to determine the level of system accuracy.

Collecting data

This study relies on reference weighting criteria data derived from journals, interviewing interviewees of resource persons observation data from bird breeding places, in addition to strengthening other official sources as well as from the Indonesian lovebird breeding website**.**(DLHK Provinsi Banten, 2019) then processed manually as needed to design a decision support system(Defit et al., 2021). The data criteria are variables used in calculating the best lovebird quality recommendations

Table.1 List of Criteria and Sub Criteria

Code	Criterions	Sub Criteria	Preference Value
KC1	Beak Shape	Dry Short	1
		Thin Pointy	3
		Thick Curved	5
KC2	Foot	Paralyzed	1
		Limp	3
		Gripping	5
KC3	Head Shape	Oval Shape	1
		Round Shape	3
		Protruding Forehead	5
KC4	Posture	Disability	1
		No Defects (Standard)	3
		Proportional	5
KC5	Fur Condition	Loss	1
		Tidy	3
		Soft	5
		Shiny	7
KC6	Behaviour	Silent Snuggle	1
		Very Agile	3
		Sounding Voice	5

Table 1 shows a list of types of criteria or physical characteristics *of lovebirds* as many as 6 criteria names and has each sub-criterion consisting of codes C1 to C6 that have been determined and processed preference values by related sources. Furthermore, alternative data are the names of *lovebird* species that belong to 9 species of the genus *Agapornis*(Charli, Syaputra, Akbar, Sauda, & Panjaitan, 2020). And the assessment will be done is one of these types is the type of *Agapornis roseicollis.*

Table.2 List of Alternatives to Lovebird Options

Alternative Code	Alternative Name
L1	Lovebird Albino
L2	Lovebird Lutino
L3	Lovebird Golden Cherry
L4	Lovebird Pied
L5	Lovebird Cinnamon
L6	Lovebird Biru

Table 2 contains data on *lovebird* names displayed as many as 6 tails of the same species, data obtained from the indonesian *lovebird* farming website (DLHK Provinsi Banten, 2019) It consists of each of the alternative codes from L1 to L6 applied to the study.

Comparison of Method Combinations

After collecting the data needed to find out the consistency of precision and accuracy of which combination of methods will be applied to this study, a comparison test is conducted. By comparing 2 other method combinations namely *analitycal hierarchy process* and *weighted product* with *analitycal hierarchy process* and technique for others reference *by similarity to ideal solution.* With the formula of the combination method ahp and WP (Krismadewi, 2021)

$$\Lambda maks = \frac{\text{Jumlah}}{n}$$
$$CI = \frac{\lambda maks - n}{n} \quad \text{.........................(1)}$$
$$CR = \frac{CI}{IR}$$

CR = ratio consistency
CI = index consistency
n = the number of elements
IR = random index

The preference for Ai alternatives starts from looking for vector values S and vector V

$$S_i = \prod_j^n = 1^{{X_{ij}}^{Wj}} \quad \text{......................... (2)}$$

$$V_i = \frac{\prod_j^n=1^{{X_{ij}}^{Wj}}}{\prod_j^n=1^{{X_{ij}}^{Wj}} {*Wj}} \quad \text{......................... (3)}$$

Stated, *i* is the result of alternative preferences to – i and Π is the sum of the results of the multiplication of alternative rankings of each attribute. And the results showed the highest and lowest values(Perdana, Defit, & Sumijan, 2020).

Furthermore, the formula combination of AHP and Topsis methods is used to determine the final data results (Amalia et al., 2019). For the formula AHP is the same as the equation(1) and continued with the formula Topsis.

The method comparison process in this study uses *the Mean Squared Error* (MSE)forecasting model to find out which method is best(Sugianto et al., 2021). The formula for calculating MSE is:

$$MSE = \frac{\sum e_i^2}{n} = \frac{\sum (X_i - F_i)^2}{n} \quad (4)$$

Xi : Preliminary Data
Fi : Final Data
n : Number of criteria

The first step is done by determining the initial amount of data from each criterion and alternative. Then calculate the deviation value of each method.

Table 3 Determination of Deviation of AHP-WP

Preliminary Data	Final Data	(Deviation)^2
20	0.185	392.63
20	0.146	394.18
18	0.249	315.09
20	0.152	393.94
16	0.137	251.63
20	0.131	394.77
Sum		2355.78

Table 3 contains the initial data obtained from the sum of the comparison of criteria of the AHP method and the final data is obtained from the total calculation of the AHP and WP methods. Then count using the equation (4).

MSE = 2355.78/6 = 392.63

Table.4 Determination of Deviation of AHP-TOPSIS

Preliminary Data	Final Data	(Deviation)^2
20	0.494	380.48
20	0.429	383.02
18	0.678	300.05
20	0.442	382.51
16	0.437	242.20
20	0.372	385.25
Sum		2073.51

Table 4 contains the initial data obtained from the sum of the comparison of criteria of the AHP method and the final data is obtained from the total calculation of the AHP and Topsis methods. Then calculate using the equation (1).

MSE = 2073.51/6 = 345.58

Table.5 Final Results of Method Comparison

No	Combination of Methods	MSE
1	*analytical hierarchy process dan weighted product*	392.63
2	*analytical hierarchy rocess dan* TOPSIS	345.58
	Max Deviasi	392.63

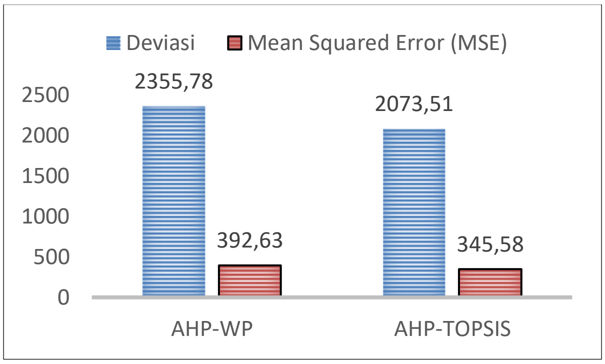

Figure*2.* End Results of Method Comparison

Based on Table 5 it can be determined that the visualization of the graph calculation of the bar diagram shows the AHP-WP method gets a deviation value of 2355.78 and a total of MSE 392.63 and the AHP-TOPSIS method gets a deviation value of 2073.51 and a total of MSE 345.58, so the researcher decided to use the combination of AHP-WP methods as the basic reason for producing the highest value in determining the selection of quality *lovebirds* (Imam, 2020).

System Creation

Creation starts from research on criteria data and criterion values. The creation of a flow overview of the implementation of *the analitycal hierarchy process* and *weighted product* method can be seen in the flowchart image(Novira, Mubarok, & Shofa, 2020):

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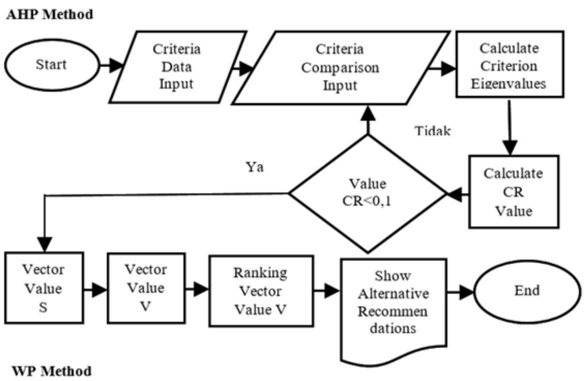

Figure 3. *Flowchart* System

Figure 3 can be explained that the flow of the system design begins by using the analytical hierarchy process method. The first process is to input the criteria data, then continue by inputting the weights for each criterion, then the system will calculate the eigenvalues and CR values to find out the logical consistency of the criteria. calculate the value of vector S then vector V and arrive at the ranking of vector values so that it can display alternative recommendations based on the highest rank.

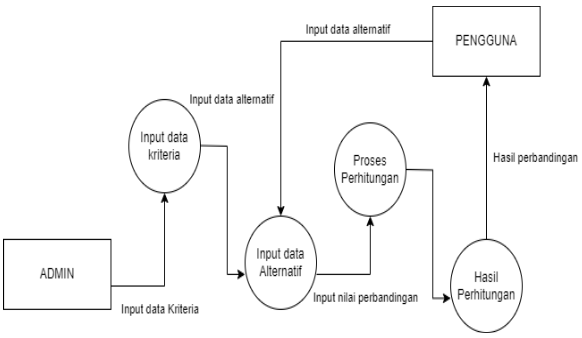

Figure 4. *Data Flow Diagram*

In Figure 4 of the system's data flow diagram for admins and users. The administrator's role is to manage system work starting from login and then inputting each criterion and preference weight value on alternative data and criteria. Then the role of the user is to input some alternative data that will later be processed by the system and produce a calculation *output* in the form of a list of the best quality *lovebirds* (Ramadhan et al., 2021).

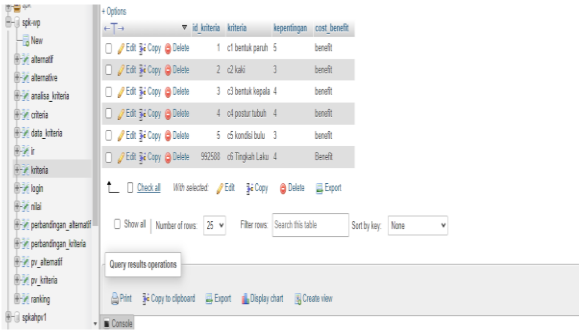

Figure 5. Database View

The next stage is to create a database containing 12 tables with results in the database view in Figure 5 which is used to accommodate table data both input and output in the application of quality *lovebird* selection decision support system.

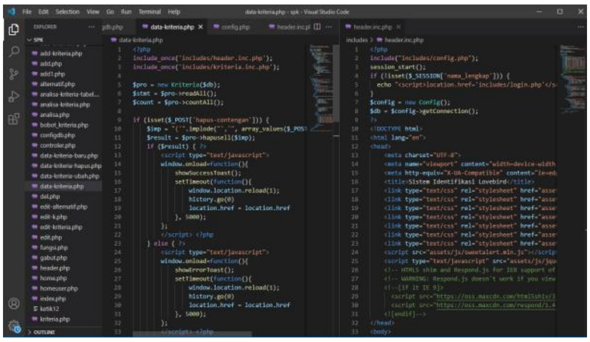

Figure 6. Program Code View

After creating the database, in Figure 6 is designed in the form of a coding structure using the PHP Native programming language with visual studio code editor software, which begins to create a framework with Bootstrap, to produce a website application support system for choosing the best *lovebird* decision from the input process to output that can be run.

System Implementation

The application of this system is *website-based* using php native, HTML, and mySQL languages as databases used. The interface results of this SPK system consist of login pages, home, criteria data, alternative data, analysis, and calculations.

Figure 7. Home View

In figure 7 is the main page and there are several menus, namely criteria data, alternative data, analysis, and calculations.

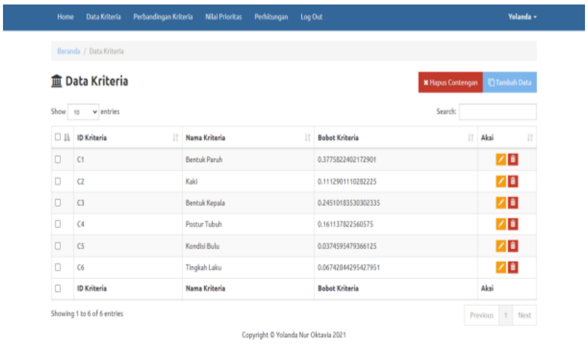

Figure 8. Criteria Data View

In figure 8 is a menu that contains criteria information consisting of the criteria id, the name of the criteria, the weight of the criteria,and then the option to edit.

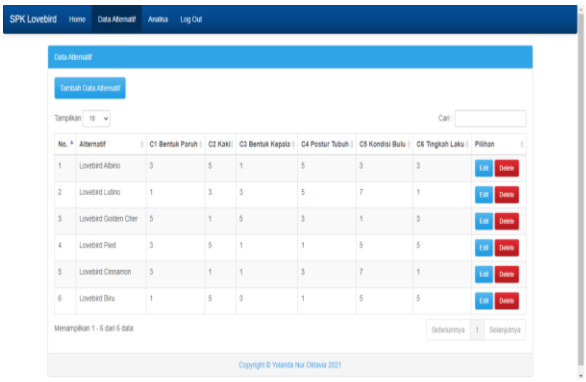

Figure 9. Alternative Data View

Figure 9 is an alternative data menu that features add alternative data and options for editing and deleting. In addition, there is a *search* feature to search for the required data using keywords quickly.

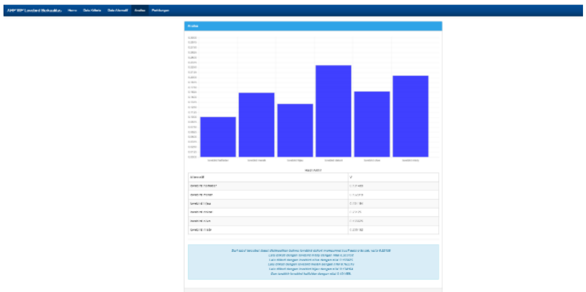

Figure 10. Analysis View

In figure 10 is an analysis menu whose function provides a graph of the results of calculations done to choose a quality *lovebird*

RESULTS AND DISCUSSION

Determining Criteria and Weighting

Based on the information that has been collected by direct observation in the field, some quality *lovebird* criteria that have the following characteristics that will be applied to the AHP method are:

Table 6. Physical Characteristics

Kode	Kriteria	Jenis
KC1	Beak shape	Benefits
KC2	Foot	Benefits
KC3	Head Shape	Benefits
KC4	Posture	Benefits
KC5	Fur Condition	Benefits
KC6	Behavior	Benefits

Table 6 classifies criteria based on the physical characteristics of a *lovebird.* Where because all criteria have a value weight that the higher the value means the better, then it belongs to the category of benefits.

Table 7. Criteria Comparison Matrix

	KC1	KC2	KC3	KC4	KC5	KC6
KC1	1.00	4.00	2.00	3.00	7.00	5.00
KC2	0.25	1.00	0.33	0.50	5.00	2.00
KC3	0.50	3.00	1.00	2.00	4.00	5.00
KC4	0.33	2.00	0.50	1.00	5.00	3.00
KC5	0.14	0.20	0.25	0.20	1.00	0.33
KC6	0.20	0.50	0.20	0.33	3.00	1.00
Sum	2.43	10.7	4.28	7.03	25.00	16.33

In Table 7 to determine the assessment, a comparison of the criteria comparison matrix (Andriyani & Yuma, 2020). The description is based on the level of importance of the criteria compared to other criteria. The weighting of each criterion is based on determining the ahp formula that has been determined according to the priority interests obtained from the table(Andriyani & Yuma, 2020)

Table 8. Saaty Table

Value	Definition	Information
1	Equally - equally important	Both have the same influence.
3	A Little Important	The ratio of one is slightly higher than the second.
5	More Important	The ratio of one is higher than the second.
7	Very Important	The ratio of one is very higher than the second.
9	Absolutely Essential	The ratio of one is absolutely very strong from the second.
2, 4, 6, 8	Value among them	Both have an adjacent assessment.

Table 8 is a saaty table that has a relative importance level value between two criteria based on the decision maker's assessment and will form a paired comparison matrix(Nurajizah, Ambarwati, & Muryani, 2020).

Table 9. Synthesis of Criteria Comparison

Number of Each Element						Sum	Average
0.41	0.37	0.47	0.43	0.28	0.31	**2.27**	**0.38**
0.10	0.09	0.08	0.07	0.20	0.12	**0.67**	**0.11**
0.21	0.28	0.23	0.28	0.16	0.31	**1.47**	**0.25**
0.14	0.19	0.12	0.14	0.20	0.18	**0.97**	**0.16**
0.06	0.02	0.06	0.03	0.04	0.02	**0.22**	**0.04**
0.08	0.05	0.05	0.05	0.12	0.06	**0.40**	**0.07**

Table 9 is the result of the calculation of each element and the number and average of the elements form a comprehensive comparison table of standards that will be used as the basis for ranking criteria. The next step is to calculate the consistency ratio (CR). By calculating the first contingency index (CI) using the equation (1).

CI $= \frac{\lambda maks - n}{n}$

Λ maks = (2.43*0.38)+(10.7*0.12)+(4.28*0.25)+(7.03*0.16)+(25*0.04)+(16.33*0.07) = 6,533

n = 6

CI = (6,533-6)/(6-1) = 0,106

CR = CI/IR = 0,106/1,24 = 0,085

Referring to the above point of 0.085 it can meet the provisions of CR<0.1 so that the process of analyzing quality *lovebird* selection criteria is said to be consistent.

The result of calculating the above average value is the main weight or component of each criterion, and certainly becomes the preferred weight of the WP method. Then continued with the calculation of the WP method that determines some alternatives to *lovebird* and previous criteria to get a quality type of*ovebird* l.

Table 10. Alternative Value Criteria

Alternatif	Criterions					
	KC1	KC2	KC3	KC4	KC5	KC6
L1	3	5	1	5	3	3
L2	1	3	3	5	7	1
L3	5	1	5	3	1	3
L4	3	5	1	1	5	5
L5	3	1	1	3	7	1
L6	1	5	3	1	5	5

Table 10 is a data input by the user that displays the preference value based on the type of *lovebird* with its sub criteria referring to Table 1 and then is the initial data in the determination of the deviation of AHP-WP in Table 3.

Table11. Preference Weights

KC1	KC2	KC3	KC4	KC5	KC6
0.38	0.11	0.25	0.16	0.04	0.07

Table 11 is the result of calculating the average value of each criterion in table 12 and will be the power value in the next calculation step.

Determining Vector Value S

The next step is to determine the vector S, i.e. by adjusting the weight of the criteria and multiplying by the weight of each preference using the equation (2).

Tabel 12. Vector Class S

Vector Value S	Result
VS1	2,645
VS2	2,076
VS3	3,548
VS4	2,163
VS5	1,956
VS6	1,875
Sum	14,265

Table 12 is the result of the weight of the data from each calculation of the value of the vector S of each alternative.

Determining value V

The next determination is the process of playing by calculating vector classes. That is, the result of dividing the value of weight S with the number of alternative rating multiplication results per attribute using the equation (3).

Table 13. Ranking Results

VECTOR	RESULT	RANKING
V1	0.185	2
V2	0.146	4
V3	0.249	1
V4	0.152	3
V5	0.137	5
V6	0.131	6

In Table 13 is a settlement in the assessment process in the form of a role. Based on the results of preference calculations in table 13. So in order of the best quality *lovebird* is the first rank of golden cherry *lovebird* with code L3, second rank albino *lovebird* with code L1, third rank *lovebird pied* with code L4, fourth rank *lovebird lutino* with code L2, fifth rank *lovebird cinnamon* with code L5, and last rank blue *lovebird* with code L6.

Testing Results

From the results of manual calculations that have been done by entering 6 different criteria obtained the final results of the assessment that has been included in reference to Table 13 has recommended the best quality *lovebird* that ranked first, namely *the golden cherry lovebird* with a value of 0.249.

Table 14. Alternative Sample Data Input Scenario Testing Results

No	Alternative Code & Preference Value	System Values	Manual Value	Highest Rank	Desc
1	L1: [KC1.5], [KC2.5], [KC3.5], [KC4.5], [KC5.7], [KC6.5] ; L2: [KC1.3], [KC2.1],[KC3.3], [KC4.1], [KC5.1], [KC6.3]	0.704	0.704	Lovebird Albino	28
2	L1: [KC1.3], [KC2[5], [KC3.1], [KC4.5], KC5.3], [KC6.3] ; L2: [KC1.1], [KC2.3], [KC3.3], [KC4.5], [KC5.7], [KC6.1] ; L3: [KC1.5], [KC2.1], [KC3.5], [KC4.3], [KC5.1], [KC6.3] ; L4: [KC1.3], [KC2.5], [KC3.1], [KC4.1], [KC5.5], [KC6.5] ; L5: [KC1.3], [KC2.1], [KC3.1], [KC4.53, [KC5.7], [KC6.1] ; L6 : [KC1.1], [KC2.5], [KC3.3], [KC4.1], [KC5.5], [KC6.5]	0.2487	0.249	Lovebird Golden Cherry	63
3	L4: [KC1.1], [KC2.5], [KC3.1], [KC4.1], [KC5.3], [KC6.5] ; L5: [KC1.5], [KC2.5], [KC3.5], [KC4.5], [KC5.7], [KC6.5]	0.786	0.786	Lovebird Cinnamon	12
4	L4: [KC1.3], [KC2.5], [KC3.1], [KC4.1], [KC5.5], [KC6.5] ; L2: [KC1.3], [KC2.5], [KC3.3], [KC4.3], [KC5.3], [KC6.3]	0.5973	0.597	Lovebird Lutino	49
5	L1: [KC1.5], [KC2.5], [KC3.5], [KC4.3], [KC5.7], [KC6.5] ; L3: [KC1.1], [KC2.3], [KC3.1], [KC4.1], [KC5.1], [KC6.5]	0.789	0.790	Lovebird Albino	9
6	L1: [KC1.1], [KC2.5], [KC3.5], [KC4.3], [KC5.1], [KC6.3] ; L4: [KC1.3], [KC2.3], [KC3.3], [KC4.1], [KC5.5], [KC6.5] ; L5: [KC1.1], [KC2.1], [KC3.1], [KC4.3], [KC5.3], [KC6.1]	0.4316	0.432	Lovebird Pied	59
7	L2: [KC1.5], [KC2.5], [KC3.3], [KC4.3], [KC5.7], [KC6.5] ; L4: [KC1.1], [KC2.1], [KC3.1], [KC4.1], [KC5.1], [KC.5]	0.799	0.799	Lovebird Lutino	4
8	L2: [KC1.5], [KC2.1], [KC3.5], [KC4.3], [KC5.3], [KC6.3] ; L5: [KC1.1], [KC2.3], [KC3.3], [KC4.5], [KC5.7], [KC6.1] ; L6: [KC1.3], [KC2.3], [KC3.3], [KC4.1], [KC5.5], [KC6.1]	0.4528	0.453	Lovebird Lutino	57
9	L3: [KC1.5], [KC2.5], [KC3.5], [KC4.5], [KC5.7], [KC6.1] ; L4: [KC1.3], [KC2.1], [KC3.1], [KC4.1], [KC5.3], [KC6.1]	0.743	0.743	Lovebird Golden Cherry	20
10	L3: [KC1.3], [KC2.3], [KC3.3], [KC4.1], [KC5.5], [KC6.1] ; L5: [KC1.5], [KC2.3], [KC3.3], [KC4.5], [KC5.5], K[C6.5]	0.6176	0.618	Lovebird Cinnamon	46
11	L4: [KC1.5], [KC2.5], [KC3.5], [KC4.5], [KC5.7], [KC6.5] ; L1: [KC1.1], [KC2.1], [KC3.1], [KC4.1], [KC5.1], [KC6.1]	0.837	0.837	Lovebird Pied	1
12	L2: [KC1.1], [KC2.1], [KC3.5], [KC4.1], [KC5.1], [KC6.3] ; L4: [KC1.5], [KC2.5], [KC3.1], [KC4.5], [KC5.5], [KC6.5]	0.623	0.623	Lovebird Lutino	44
13	L6: [KC1.5], [KC2.5], [KC3.5], [KC4.3], [KC5.7], [KC6.3] ; L1: [KC1.1], [KC2.1], [KC3.1], [KC4.3], [KC5.1], [KC6.1]	0.793	0.793	Lovebird Albino	6
14	L5: [KC1.3], [KC2.5], [KC3.5], [KC4.3], [KC5.5], [KC6.5] ; L3: [KC1.3], [KC2.1], [KC3.1], [KC4.1], [KC5.1], K[C6.3]	0.701	0.702	Lovebird Cinnamon	29
15	L5: [KC1.1], [KC2.3], [KC3.3], [KC4.3], [KC5.3], [KC6.1] ; L6: [KC1.5], [KC2.1], [KC3.1], [KC4.3], [KC5.7], [KC6.5]	0.610	0.600	Lovebird Biru	48

No	Alternative Code & Preference Value	System Values	Manual Value	Highest Rank	Desc
16	L3: [KC1.5], [KC2.3], [KC3.5], [KC4.5], [KC5.7], [KC6.3] ; L2: [KC1.1], [KC2.3], [KC3.3], [KC4.1], [KC5.1], [KC6.1]	0.759	0.760	Lovebird Golden Cherry	16
17	L3: [KC1.1], [KC2.5], [KC3.3], [KC4.5], [KC5.5], [KC6.5] ; L4: [KC1.3], [KC2.3], [KC3.1], [KC4.3], [KC5.7], [KC6.3] ; L5: [KC1.5], [KC2.1], [KC3.5], [KC4.3], [KC5.7], [KC6.3] ; L6: [KC1.1], [KC2.5], [KC3.3], [KC4.5], [KC5.7], [KC6.1]	0.353	0.353	Lovebird Golden Cherry	62
18	L5: [KC1.5], [KC2.5], [KC3.5], [KC4.3], [KC5.5], [KC6.5] ; L6: [KC1.3], [KC2.1], [KC3.1], [KC4.3], [KC5.1], [KC6.1]	0.733	0.733	Lovebird Cinnamon	22
19	L4: [KC1.3], [KC2.5], [KC3.3], [KC4.1], [KC5.3], [KC6.5] ; L2: [KC1.3], [KC2.5], [KC3.3], [KC4.3], [KC5.5], [KC6.5]	0.556	0.556	Lovebird Lutino	51
20	L1: [KC1.5], [KC2.5], [KC3.5], [KC4.1], [KC5.7], [KC6.5] ; L3: [KC1.5], [KC2.1], [KC3.1], [KC4.1], [KC5.1], [KC6.3]	0.666	0.666	Lovebird Albino	36
21	L3: [KC1.5], [KC2.5], [KC3.3], [KC4.3], [KC5.3], [KC6.5] ; L5: [KC1.3], [KC2.3], [KC3.3], [KC4.1], [KC5.1], [KC6.1]	0.660	0.660	Lovebird Golden Cherry	37
22	L2: [KC1.5], [KC2.5], [KC3.5], [KC4.5], [KC5.7], [KC6.5] ; L4: [KC1.1], [KC2.3], [KC3.1], [KC4.3], [KC5.1], [KC6.1]	0.771	0.771	Lovebird Lutino	14
23	L2: [KC1.1], [KC2.3], [KC3.1], [KC4.3], [KC5.1], [KC6.1] ; L5: [KC1.5], [KC2.5], [KC3.3], [KC4.5], [KC5.1], [KC6.5]	0.757	0.757	Lovebird Lutino	17
24	L3: [KC1.5], [KC2.5], [KC3.5], [KC4.5], [KC5.7], [KC6.5] ; L4: [KC1.1], [KC2.3], [KC3.1], [KC4.3], [KC5.3], [KC6.1]	0.791	0.792	Lovebird Golden Cherry	7
25	L3: [KC1.3], [KC2.5], [KC3.3], [KC4.1], [KC5.5], [KC6.1] ; L5: [KC1.5], [KC2.3], [KC3.3], [KC4.5], [KC5.5], [KC6.5]	0.624	0.624	Lovebird Cinnamon	43
26	L4: [KC1.1], [KC2.1], [KC3.5], [KC4.1], [KC5.3], [KC6.1] ; L1: [KC1.5], [KC2.5], [KC3.3], [KC4.5], [KC5.1], [KC6.3]	0.721	0.721	Lovebird Albino	25
27	L2: [KC1.5], [KC2.5], [KC3.3], [KC4.5], [KC5.7], [KC6.5] ; L4: [KC1.5], [KC2.1], [KC3.1], [KC4.1], [KC5.5], [KC6.1]	0.697	0.697	Lovebird Lutino	30
28	L6: [KC1.5], [KC2.3], [KC3.5], [KC4.3], [KC5.7], [KC6.5] ; L5: [KC1.3], [KC2.1], [KC3.5], [KC4.1], [KC5.1], [KC6.3]	0.646	0.647	Lovebird Pied	40
29	L3: [KC1.5], [KC2.3], [KC3.5], [KC4.7], [KC5.3], [KC6.5] ; L5: [KC1.1], [KC2.3], [KC3.1], [KC4.1], [KC5.1], [KC6.3]	0.794	0.794	Lovebird Golden Cherry	5
30	L5: [KC1.1], [KC2.1], [KC3.5], [KC4.3], [KC5.7], [KC6.5] ; L6: [KC1.5], [KC2.1], [KC3.1], [KC4.3], [KC5.7], [KC6.3]	0.543	0.543	Lovebird Biru	52
31	L1: [KC1.5], [KC2.5], [KC3.5], [KC4.3], [KC5.7], [KC6.5] ; L2: [KC1.1], [KC2.1], [KC3.1], [KC4.1], [KC5.1], [KC6.3]	0.800	0.800	Lovebird Albino	3
32	L1: [KC1.3], [KC2.3], [KC3.1], [KC4.1], [KC5.7], [KC6.3]; L3: [KC1.1], [KC2.5], [KC3.1], [KC4.1], [KC5.1], [KC6.3] ; L4: [KC1.1], [KC2.3], [KC3.5], [KC4.1], [KC5.1], [KC6.5]	0.394	0.394	Lovebird Albino	61
33	L4: [KC1.5], [KC2.5], [KC3.3], [KC4.5], [KC5.5], [KC6.3] ; L5: [KC1.3], [KC2.1], [KC3.1], [KC4.1], [KC5.1], [KC6.3]	0.724	0.725	Lovebird Pied	24
34	L4: [KC1.3], [KC2.5], [KC3.1], K[C4.1], [KC5.5], [KC6.5] ; L2: [KC1.3], [KC2.5], [KC3.3], [KC4.3], [KC5.5], [KC6.3]	0.622	0.622	Lovebird Lutino	45
35	L1: [KC1.1], [KC2.5], [KC3.3], [KC4.1], [KC5.3], [KC6.5] ; L3: [KC1.5], [KC2.1], [KC3.5], [KC4.3], [KC5.7], [KC6.5]	0.6839	0.684	Lovebird Golden Cherry	33
36	L1: [KC1.5], [KC2.5], [KC3.5], [KC4.5], [KC5.7], [KC6.5] ; L4: [KC1.3], [KC2.3], [KC3.3], [KC4.1], [KC5.5], [KC6.5]	0.802	0.802	Lovebird Albino	2
37	L2: [KC1.5], [KC2.5], [KC3.5], [KC4.5], [KC5.7], [KC6.1] ; L4: [KC1.3], [KC2.1], [KC3.1], [KC4.1], [KC5.1], [KC6.5]	0.730	0.730	Lovebird Lutino	23
38	L2: [KC1.5], [KC2.5], [KC3.5], [KC4.3], [KC5.3], [KC6.3] ; L5: [KC1.1], [KC2.3], [KC3.3], [KC4.3], [KC5.7], [KC6.1] ; L6: [KC1.3], [KC2.3], [KC3.3], [KC4.1], [KC5.5], [KC6.1]	0.484	0.484	Lovebird Lutino	56
39	L3: [KC1.5], [KC2.5], [KC3.3], [KC4.5], [KC5.5], [KC6.5] ; L4: [KC1.3], [KC2.3], [KC3.1], [KC4.1], [KC5.1], [KC6.3]	0.707	0.707	Lovebird Golden Cherry	27
40	L3: [KC1.3], [KC2.3], [KC3.3], [KC4.1], [KC5.5], [KC6.1] ; L5: [KC1.5], [KC2.5], [KC3.3], [KC4.5], [KC5.5], [KC6.5]	0.650	0.650	Lovebird Cinnamon	39

No	Alternative Code & Preference Value	System Values	Manual Value	Highest Rank	Desc
41	L4: [KC1.5], [KC2.5], [KC3.3], [KC4.5], [KC5.5], [KC6.1] ; L1: [KC1.3], [KC2.3], [KC3.3], [KC4.1], [KC5.1], [KC6.1]	0.639	0.639	Lovebird Pied	42
42	L2: [KC1.3], [KC2.1], [KC3.1], [KC4.1], [KC5.1], [KC6.3] ; L4: [KC1.5], [KC2.3], [KC3.5], [KC4.5], [KC5.7], [KC6.5]	0.748	0.748	Lovebird Pied	18
43	L6: [KC1.5], [KC2.5], [KC3.5], [KC4.5], [KC5.7], [KC6.1] ; L1: [KC1.3], [KC2.3], [KC3.3], [KC4.1], [KC5.1], [KC6.1]	0.671	0.671	Lovebird Biru	34
44	L3: [KC1.5], [KC2.5], [KC3.3], [KC4.5], [KC5.7], [KC6.3] ; L5: [KC1.1], [KC2.1], [KC3.3], [KC4.1], [KC5.1], [KC6.1]	0.768	0.768	Lovebird Golden Cherry	15
45	L5: [KC1.1], [KC2.3], [KC3.3], [KC4.3], [KC5.3], [KC6.5] ; L6: [KC1.5], [KC2.1], [KC3.5], [KC4.3], [KC5.7], [KC6.5]	0.6575	0.657	Lovebird Biru	38
46	L1: [KC1.3], [KC2.5], [KC3.1], [KC4.5], [KC5.3], [KC6.3] ; L2: [KC1.1], [KC2.3], [KC3.3], [KC4.5], [KC5.7], [KC6.1]	0.560	0.560	Lovebird Albino	50
47	L1: [KC1.1], [KC2.5], [KC3.1], [KC4.5], [KC5.3], [KC6.3] ; L2: [KC1.1], [KC2.3], [KC3.3], [KC4.5], [KC5.7], [KC6.1] ; L3: [KC1.5], [KC2.1], [KC3.5], [KC4.3], [KC5.1], [KC6.3] ; L4: [KC1.3], [KC2.5], [KC3.5], [KC4.1], [KC5.5], [KC6.5] ; L5: [KC1.3], [KC2.5], [KC3.1], [KC4.3], [KC5.7], [KC6.1] ; L6 : [KC1.1], [KC2.5], [KC3.3], [KC4.1], [KC5.7], [KC6.5]	0.239	0.239	Lovebird Golden Cherry	64
48	L4: [KC1.5], [KC2.5], [KC3.3], [KC4.5], [KC5.5], [KC6.5] ; L5: [KC1.1], [KC2.5], [KC3.1], [KC4.1], [KC5.1], [KC6.1] ;	0.789	0.789	Lovebird Pied	10
49	L4: [KC1.3], [KC2.5], [KC3.1], [KC4.1], [KC5.5], [KC6.5] ; L2: [KC1.3], [KC2.5], [KC3.3], [KC4.3], [KC5.5], [KC6.3]	0.612	0.612	Lovebird Lutino	47
50	L1: [KC1.5], [KC2.5], [KC3.3], [KC4.1], [KC5.5], [KC6.5] ; L3: [KC1.5], [KC2.1], [KC3.5], [KC4.3], [KC5.1], [KC6.5]	0.515	0.515	Lovebird Golden Cherry	54
51	L1: [KC1.1], [KC2.5], [KC3.5], [KC4.3], [KC5.1], [KC6.1] ; L4: [KC1.3], [KC2.3], [KC3.3], [KC4.1], [KC5.5], [KC6.5] ; L5: [KC1.1], [KC2.5], [KC3.1], [KC4.3], [KC5.3], [KC6.1]	0.4267	0.427	Lovebird Pied	60
52	L2: [KC1.1], [KC2.3], [KC3.1], [KC4.1], [KC5.5], [KC6.1] ; L4: [KC1.5], [KC2.5], [KC3.5], [KC4.5], [KC5.7], [KC6.1]	0.792	0.791	Lovebird Pied	8
53	L2: [KC1.1], [KC2.3], [KC3.1], [KC4.1], [KC5.1], [KC6.1] ; L5: [KC1.5], [KC2.5], [KC3.3], [KC4.5], [KC5.1], [KC6.5]	0.787	0.787	Lovebird Lutino	11
54	L3: [KC1.3], [KC2.1], [KC3.3], [KC4.1], [KC5.1], [KC6.1] ; L1: [KC1.3], [KC2.5], [KC3.5], [KC4.5], [KC5.5], [KC6.3]	0.668	0.668	Lovebird Albino	35
55	L3: [KC1.3], [KC2.3], [KC3.3], [KC4.1], [KC5.5], [KC6.1] ; L5: [KC1.5], [KC2.3], [KC3.3], [KC4.5], [KC5.7], [KC6.5]	0.640	0.640	Lovebird Cinnamon	41
56	L4: [KC1.5], [KC2.5], [KC3.5], [KC4.5], [KC5.3], [KC6.1] ; L1: [KC1.3], [KC2.1], [KC3.3], [KC4.1], [KC5.1], [KC6.1]	0.690	0.690	Lovebird Pied	31
57	L2: [KC1.3], [KC2.1], [KC3.1], [KC4.1], [KC5.5], [KC6.1] ; L4: [KC1.5], [KC2.5], [KC3.5], [KC4.5], [KC5.1], [KC6.5]	0.746	0.746	Lovebird Pied	19
58	L6: [KC1.5], [KC2.5], [KC3.3], [KC4.5], [KC5.5], [KC6.3] ; L1: [KC1.1], [KC2.3], [KC3.1], [KC4.3], [KC5.1], [KC6.5]	0.741	0.741	Lovebird Biru	21
59	L3: [KC1.1], [KC2.5], [KC3.1], [KC4.3], [KC5.3], [KC6.5] ; L5: [KC1.1], [KC2.3], [KC3.3], [KC4.5], [KC5.7], [KC6.1] ; L6: [KC1.3], [KC2.3], [KC3.5], [KC4.1], [KC5.1], [KC6.5]	0.4338	0.434	Lovebird Biru	58
60	L5: [KC1.5], [KC2.3], [KC3.3], [KC4.3], [KC5.3], [KC6.1] ; L6: [KC1.5], [KC2.5], [KC3.1], [KC4.3], [KC5.7], [KC6.5]	0.5179	0.518	Lovebird Cinnamon	53
61	L4: [KC1.3], [KC2.5], [KC3.5], [KC4.1], [KC5.5], [KC6.5] ; L2: [KC1.3], [KC2.5], [KC3.3], [KC4.3], [KC5.7], [KC6.3]	0.506	0.506	Lovebird Lutino	55
62	L1: [KC1.1], [KC2.5], [KC3.3], [KC4.1], [KC5.5], [KC6.3] ; L3: [KC1.5], [KC2.1], [KC3.5], [KC4.3], [KC5.7], [KC6.5]	0.687	0.687	Lovebird Golden Cherry	32
63	L1: [KC1.1], [KC2.5], [KC3.1], [KC4.1], [KC5.3], [KC6.1] ; L4: [KC1.5], [KC2.5], [KC3.3], [KC4.5], [KC5.7], [KC6.5]	0.784	0.784	Lovebird Albino	13
64	L2: [KC1.5], [KC2.1], [KC3.5], [KC4.5], [KC5.1], [KC6.5] ; L4: [KC1.3], [KC2.1], [KC3.1], [KC4.1], [KC5.1], [KC6.3]	0.708	0.708	Lovebird Lutino	26

Referring to Table 14 contains the results of 64 data testing scenarios input alternative sample data based on *lovebird* type and sub-criteria obtained an accuracy rate of 100% with true test data as much as 64 out of 64 total tests by manual calculation and system calculation. Good quality *lovebird* determination tests were conducted as many as 64 tests of evidence of different *input* samples. Of the 64 best rankings, the first rank lovebird is Lovebird Pied with a value 0.837. From the experiment, the table was created containing alternative codes for the bird's name and weight preference criteria, the results of manual calculation values, the results of system calculation values, the highest ranking of the bird's name, and description of the rating of each lovebird.

Table 15. Basic Accuracy Percentage Assessment

Category Level	Percentage Value
Very Low	0% - 20%
Low	21% - 40%
Moderate	41% - 60%
High	61% - 80%
Very High	81% - 100%

In Table 15(Kurniawan, 2017) shows the accuracy of the system accuracy which refers to the test results from table 14 it can be concluded that there are 3 levels of categories where as many as 4 users or about 6% of 64 tests with **Low** accuracy category levels in the results of *lovebird* immersion best with a percentage value of 21%-40%. Furthermore, as many as 12 users or about 19% of 64 tests with a **Moderate** accuracy category level in the best *lovebird* communication results with a percentage value of 41%-60% Then as many as 48 users or about 75% of 64 tests with a **High** accuracy category level in the results of *lovebird* communication best with a percentage value of 61%-80%. And there are no users whose percentage value is below 20% or very low and above 81% or very high that has been recommended by the system or manually.

CONCLUSION

Based on the results of research and design obtained a website-based application system on identifying the selection of quality *lovebirds* designed with Native PHP programming and MySQL as databases. This application contains 6 criteria data consisting of each of 3 physical sub-criteria *of lovebird* and 6 alternative data of *selected lovebird* names in the same species. In addition, this application also combines 2 methods namely *analytical hierarchy process* and *weighted product* with test conclusions on 64 alternative sample evidence based on *lovebird* type and sub-criteria both in system calculations and manual calculations that result in low accuracy category levels. with a percentage value of 21%-40%. Furthermore, as many as 12 users or about 19% of 64 tests with a moderate accuracy category level with a percentage value of 41%-60% Then as many as 48 users or about 75% of 64 tests with a high accuracy category level in the best *lovebird* communication results with a percentage value of 61%-80%. This decision support system as an application that produces the highest ranking in helping recommend the decision of determining the best quality *lovebird.* This designed application can still be developed even better and is recommended for its development to be used with other methods and implementations

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