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Selection and Evaluation SmartPhones Recommended AHP, Weight Sum Model and Weight Product

Akmaludin[1)*], Erene Gernaria Sihombing [2)], Linda Sari Dewi[3)], Rinawati [4)], Ester Arisawati [5)]
[1,2,3,4,5)]Universitas Nusa Mandiri, Jakarta, Indonesia
[1)]akmaludin.akm@nusamandiri.ac.id, [2)]erene.egs@nusamandiri.ac.id, [3)]linda.lrw@nusamandiri.ac.id, [4)]rinawati.riw@nusamandiri.ac.id, [5)]ester.err@nusamandiri.ac.id

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Abstract: Advances in SmartPhone technology in the current era, make many users have more and more considerations to have a SmartPhone because there are many criteria that must be compared. The purpose of this paper is to give careful consideration for every user to have an optimal SmartPhone. Problems that are felt by many users as users find it difficult to make choices for electronic goods in the form of this SmartPhone. Thus, a number of methods are needed that are able to give careful and intelligent consideration to the user in order to obtain the acquisition of the electronic goods in the form of the SmartPhone. In short, the method that can be used to evaluate and select SmartPhones is the Analytic Hierarchical Process (AHP) which functions as a weight determination, while the Weight Sum Model (WSM) and Weight Product (WP) act as a ranking system. This method will be used to provide an optimal comparison value for SmartPhone products with decisions that can be seen based on the priority of the WSM vector and the WP vector, then based on the average of the two methods provide decision support results. The first position is Xiaomi Mi Max with a weight of 175 and followed sequentially onwards by Asus Zenfone Max ZC550KL (174), Samsung Galaxy J7 Prime (124), Lenovo Vibe Shot (117), Asus Zenfone 2 ZE551ML (113), Xiaomi Mi 4C (108), Lenovo Vibe K5 Plus (101), and finally the Samsung Galaxy A3 (89). Thus the combination method between the AHP, WSM and WP methods can provide the best solution with optimal results for decision-making support for comparison evaluation and selection in the form of a SmartPhone with optimal results.

Keywords: AHP, Evaluation, Priority, Selection, Weight Product, Weight Sum Model.

INTRODUCTION

Technological trends are getting faster and faster, technological advances that strongly support the progress of electronic goods are increasingly visible in the eyes of users as electronic users. Smartphones are part of electronic goods that are very much needed by every user to carry out the process of communication and transactions between one user and another (Technologies, 2014) and always want to improve customer satisfaction (Rapitasari, 2016). Many careful considerations must be made by the user to acquire a SmartPhone, even the use of a SmartPhone is no longer just using it, it has even become a prestigious item to be a show to anyone who owns it. The problem that arises is how best to choose this SmartPhone product so you don't regret using it in the future (Hapsoro et al., 2019). The purpose of this research is to provide guidance and knowledge on how to compare the evaluation and selection of electronic products in the form of SmartPhones properly and optimally in their use which is adjusted to the price of the SmartPhone. SmartPhone is a technology that is reliable

*name of corresponding author

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and very useful for every user who uses it (Gemiharto, 2015), even it has become part of the body of every user who uses it. If you forget to bring your smartphone, you feel that something is missing or you feel uncomfortable if you don't bring the item.

Back to the issue of how to do a comparison of selection and evaluation of electronic goods in the form of this SmartPhone. There is very good method support and can be used as a basis for comparison of selection and evaluation of SmartPhones, namely three methods that can be collaborated to evaluate and select SmartPhones, namely the Analytic Hierarchical Process (AHP) Method, the Weight Sum Model (WSM) method and the Weight Product (WP) method. These three methods can be used to carry out a comparative evaluation and selection process in ranking SmartPhone products. AHP can be used to determine the weights in order to have a balance value as the determination of each weight (Akmaludin Akmaludin et al., 2020) that will be determined as a comparison of the two WSM and WP methods.

While the WSM method is used to determine the ranking in a different way compared to the WP method. Each of these ranking methods has a different method but has the same goal in selecting a SmartPhone based on the Vector Si of each method (Solikhun, 2017), WSM emphasizes addition and multiplication systems, while the WP method emphasizes a grading system (Khairina et al., 2021), both of which serve a purpose. to the respective Vector Si results. This study tries to provide a comparison of whether these two ranking methods will have the same priority value for making decisions on goods in the form of SmartPhones, or have different decision results using the two methods (WSM and WP) (Solikhun, 2017).

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LITERATURE REVIEW

Analytic Hierarchical Process (AHP)

Analytic Hierarchical Process (AHP) is a method that can be used to assign weights to a number of criteria (Gumay et al., 2020). The criteria that can be used are the types of criteria that are quantitative and qualitative. In this study(Saaty, 2009), a combination of both types of criteria, namely quantitative and qualitative, can be distinguished in its use into a ranking method by distinguishing which ones can provide benefits and which make costs (Beshah & Kitaw, 2013). The nature of the benefit criteria is that it provides a lot of benefits from the utility value of an alternative, while the cost criteria are those that provide a decreasing utility value, so that it becomes a deduction from an alternative utility scale.

The arrangement of data elements used in AHP has certain rules that can be used to assign weights to each of the compared criteria (Saaty, 2010). Comparison of criteria using the matrix multiplication system as a reference. For the criteria being compared are called Pairwise matrices, overall each criterion must be used as pairwise matrices, so that the composition of each data element of the matrices has a value with the right comparison (Ali, 2012). If in its use it has an element layout error, this will result in the calculation process being incorrect and can even give results that are always enlarged, in fact the multiplication of matrices in AHP has the aim of normalizing assessment disputes which will always be processed continuously so that there is no difference in assessment. This is one of the advantages of AHP (Dave et al., 2012), namely resolving differences in judgment and unifying decisions in small and large groups. The arrangement or layout of the elements of the criteria compared into a matrix as shown in equation 1.

$$M_{(r,s)} = \begin{bmatrix} x_{(1,1)} & x_{(1,2)} & x_{(1,3)} & \cdots & x_{(1,s)} \\ x_{(2,1)} & x_{(2,2)} & x_{(2,3)} & \cdots & x_{(2,s)} \\ x_{(3.1)} & x_{(3,2)} & x_{(2,4)} & \cdots & x_{(3,s)} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ x_{(r,1)} & x_{(r,2)} & x_{(r,3)} & \cdots & x_{(r,s)} \end{bmatrix} \quad (1)$$

In equation 1, it is a pairwise matrices which will be multiplied by itself A*A and the result will be matrices B, and so on it will be done that way repeatedly. Each matrix multiplication value will be compared to its eigenvector value, if there is a difference value then the next multiplication must be carried out, if on the contrary or there is no difference in the eigenvector value, it will find the optimal eigenvector value (Lipovetsky, 2013). The eigenvector values that have been said to be optimal can be used by other methods such as the Weight Sum Model (WSM) and Weight Product (WP), which of

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the two methods will be able to compare the results in the ranking system (Siregar, 2017). The same result with the use of the two methods (WSM and WP) gives a superior and good value to the same decision (Solikhun, 2017), otherwise it will distort the value of the decision.

For the acceptance or rejection of the pairwise matrices multiplication process, it can be proven by calculating the Consistency Index (CI) and Consistency Ratio (CR) which can be seen in equation 2 and equation 3. If the CR is less or equal to 10 percent (Imanuwelita et al., 2018), then the provisional decision can be accepted. for each step of the matrix multiplication process. If it exceeds 10 percent then the provisional decision cannot be continued (Ortiz-Barrios & López-Meza, 2016). This can be corrected in the data entry carried out through the questionnaire instrumentation used. The calculation of the CR value can be collaborated with the help of Table RI (Mazumdar, 2009),(Valasquez & Hester, 2016) which is listed in Table 1.

$$CI = \frac{(\lambda \max - n)}{(n-1)} \tag{2}$$

$$CR = \frac{CI}{RI} \tag{3}$$

Table 1. Random Index

Ordo	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RI	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.48	1.51	1.48	1.56	1.57	1.58

Weight Sum Model (WSM)

The Weight Sum Model (WSM) method is a ranking method that uses the addition system of the multiplication of the weights and values of each normalized criterion . Its use can be said to be simple but able to provide optimal results from normalized data (Solikhun, 2017). The research to be carried out follows different rules where the value of an alternative using the AHP method will be the reference for the weighting of a number of criteria . Several formulas that can be used in WSM are Normalization of a number of criteria that can be used in equation 4, while to determine the Si vector of WSM can use equation 5. The ranking system will be known through the Si vector quantity obtained based on the sum of all the criteria that have been carried out based on the multiplication of the criterion weights with each value for each alternative. WSM also has basic similarities that are owned by the Weight Average Model (WAM) in decision making, which distinguishes only the addition concept and the average concept. (Akmaludin dkk, 2017), but the basic method has the same way of solving.

$$W_{(i)} = \frac{w_j}{\sum_{j=1}^{n} w_j} \tag{4}$$

$$V_{(i)}wsm = max \sum_{i}^{i} a_{(i,j)} W_j \tag{5}$$

Product Model (WP)

The Product Model (WP) method is a ranking method by multiplying a number of alternative values that are raised to the overall rank of the criteria used (Aminudin et al., 2018). This WP method can also be said to be a simple method, but is able to provide optimum results for the rating system against a number of alternatives (A. Akmaludin, 2017) that will be processed in the ranking (Khairina et al., 2021). Several formulas that can be used with this WP method are normalization of a number of criteria that will be used as weights from a number of alternatives that can be done using equation 6, while to determine the value of the Si vector quantity, you can use equation 7. The ranking system will be known through the results obtained from the Si vector, which is the main reference in determining the weight of the results of each alternative.

$$S_{(i)} = \prod_{j=1}^{n} X_{(i,j)}{}^{(w,j)} \tag{6}$$

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$$V_{(i)} = \frac{\prod_{j=1}^{n} X_{(i,j)}{}^{(w,j)}}{\prod_{j=1}^{n} (X)_j{}^{*}} \tag{7}$$

METHOD

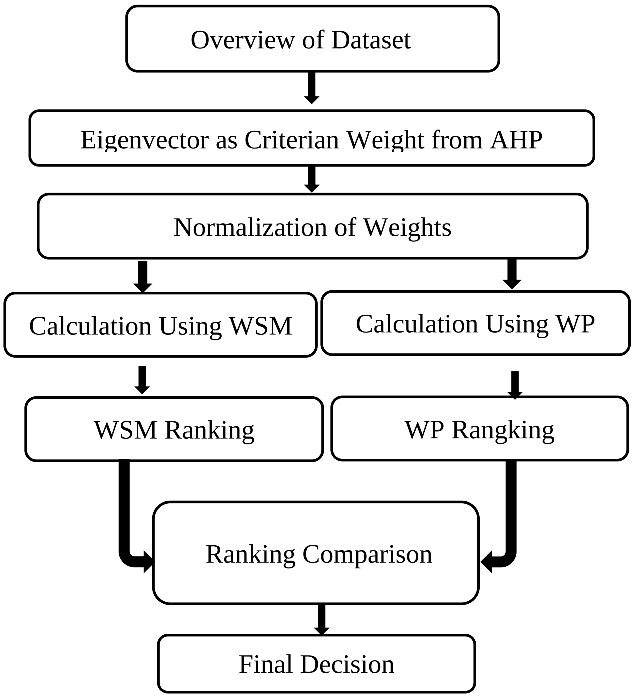

Fig. 1. AHP-WSM-WP Algorithm

RESULT

Starting from the data collection process carried out through a reliable source, namely from the arena site which provides a lot of information about various types of SmartPhones, thus the data acquisition is compiled in the form of a table that describes eight SmartPhones and is equipped with criteria specifications that lead to research interests. The data to be processed in this research can be seen in Table 1. The criteria used include eleven quantitative criteria, so that all criteria are taken into account in the form of comparisons between one criterion and another to form a pairwise matrix.

Table 1. Data Overview

Nama SmartPhone	Operating System	Processor Speed	RAM (Gyga Byte)	ROM (Gyga Byte)	Back Camera (Mega Pixcel)	Front Camera (Mega Pixcel)	Baterray	External Memory	Screen Size (Inci)	Weight (gram)	Price (Rp)
Samsung Galaxy A3	V5.1.1 (Lollipop)	Quad-core 1.5 GHz Cotex-A53	1.5	16	13	5	2300	256	4.7	132	2.699
Samsung Galaxy J7 Prime	V6.0.1 Marshmallow	Octo-core 1.6 GHz Cotex-A53	3	32	13	8	3300	256	5.5	167	3.329
Xiaomi Mi 4C	V5.1.1 (Lollipop)	Hexa-core 4x1.4 GHz Cortex-A53 2x1.8 GHz Cortex-A72	2	16	13	5	3080	0	5	132	1.439
Xiaomi Mi Max	V6.0 Marshmallow	Hexa-core Ax1.4 GHz Cortex-A53 2x1.8 GHz Cortex-A72	3	32	16	5	4850	256	6.44	203	2.557
Asus Zenfone Max ZC550KL	V5.0.1 (Lollipop)	Quad-Core 1.2 GHz Cortex-A53	2	32	13	5	5000	64	5.5	202	1.999
Asus Zenfone 2 ZE551ML	V5.0 (Lollipop)	Quad-Core 2.3 GHz	4	32	13	5	3000	256	5.5	170	3.399
Lenovo Vibe K5 Plus	V5.0.1 (Lollipop)	Octa-core 4x1.5 GHz Cortex-A53 4x1.2 GHz Cortex-A53	2	16	13	5	2750	32	5	5	2.299
Lenovo Vibe Shot	V5.0.2 (Lollipop)	Octa-core 4x1.7 GHz Cortex-A53 4x1 GHz Cortex-A53	3	32	16	8	3000	256	5	5	3.28

Source: GSM Arena

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The overview data listed in Table 1 will be simplified into the form of a simplification acronym that will make it easier to read the data that will be processed into a comparison of criteria and alternatives. The form of the simplification can be seen in Table 2 as an acronym for criteria, to make it look simpler and easier to read the table. Of the eleven criteria that are coded, there are two types, namely benefit or cost, the benefit criteria will add value to the decision value, while cost will provide a reduced value to the decision value. Criteria of type benefit or cost will be reckoned with each other in total in the final calculation.

Table 2. Criteria dan Type

Criteria	Criteria Name	Code	Type	Code
C1	Operating System	OS	Benefit	B
C2	Processor Speed	PS	Benefit	B
C3	RAM	RA	Benefit	B
C4	ROM	RO	Benefit	B
C5	Back Camera	BC	Benefit	B
C6	Front Camera	FC	Benefit	B
C7	Baterray	BT	Benefit	B
C8	External Memory	EM	Benefit	B
C9	Screen Size	SZ	Benefit	B
C10	Weight	WG	Cost	C
C11	Price	PR	Cost	C

In order to carry out the calculation process that will be applied to both WSM and WP methods, it is necessary to simplify the overview data into a form that is easier to read as shown in Table 3 as a research dataset.

Table 3. Dataset

Nama SmartPhone	C1 (B)	C2 (B)	C3 (B)	C4 (B)	C5 (B)	C6 (B)	C7 (B)	C8 (B)	C9 (B)	C10 (C)	C11 (C)
Samsung Galaxy A3	5.11	6.00	1.50	16	13	5	2300	256	4.70	132	2.699
Samsung Galaxy J7 Prime	6.01	12.80	3.00	32	13	8	3300	256	5.50	167	3.329
Xiaomi Mi 4C	5.11	9.20	2.00	16	13	5	3080	0	5.00	132	1.439
Xiaomi Mi Max	6.00	9.20	3.00	32	16	5	4850	256	6.44	203	2.557
Asus Zenfone Max ZC550KL	5.01	4.80	2.00	32	13	5	5000	64	5.50	202	1.999
Asus Zenfone 2 ZE551ML	5.00	9.20	4.00	32	13	5	3000	256	5.50	170	3.399
Lenovo Vibe K5 Plus	5.01	10.80	2.00	16	13	5	2750	32	5.00	5	2.299
Lenovo Vibe Shot	5.02	10.80	3.00	32	16	8	3000	256	5.00	5	3.280

By determining the dataset that includes a number of alternatives and a number of criteria that are used for further processing as a comparison, it is necessary to determine the value of each weight first by using instrumentation in the form of a questionnaire from 65 respondents who were collected using conventional techniques, where the data was processed using a method. three-scale conversion to get data elements in the form of pairwise matrices. Starting from the arithmetic scale to the geometric scale and finally to the ahp scale. The results of the scale conversion into the form of pairwise matrices can be seen in Table 4a.

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Table 4a. Pairwise matrices criteria using Mathematic Algebra Matrices

Criteria	OS	PS	RA	RO	CO	BC	FC	BT	EM	WG	PR	Eigenvector
Operating System (OS)	1.000	2.125	2.352	2.735	2.372	3.223	3.121	4.105	3.034	2.422	2.371	**0.193**
Processor Speed (PS)	0.471	1.000	2.063	2.362	2.436	2.347	3.034	3.142	3.268	2.046	2.042	**0.153**
RAM (RA)	0.425	0.485	1.000	2.042	2.302	2.435	2.554	2.563	2.945	3.032	2.047	**0.128**
ROM (RO)	0.366	0.423	0.490	1.000	2.034	2.153	2.237	2.225	3.035	3.023	3.214	**0.109**
Back Camera (BC)	0.422	0.411	0.434	0.492	1.000	2.342	2.326	2.043	3.055	3.026	2.425	**0.095**
Front Camera (FC)	0.310	0.426	0.411	0.464	0.427	1.000	2.045	2.138	3.042	2.162	2.133	**0.075**
Baterray (BT)	0.320	0.330	0.392	0.447	0.430	0.489	1.000	3.033	2.136	2.034	3.201	**0.067**
External Memory (EM)	0.244	0.318	0.390	0.449	0.489	0.468	0.330	1.000	2.302	2.022	2.043	**0.051**
Screen Size (SZ)	0.330	0.306	0.340	0.329	0.327	0.329	0.468	0.434	1.000	3.163	3.115	**0.049**
Weight (WG)	0.413	0.489	0.330	0.331	0.330	0.463	0.492	0.495	0.316	1.000	3.052	**0.043**
Price (PR)	0.422	0.490	0.489	0.311	0.412	0.469	0.312	0.489	0.321	0.328	1.000	**0.036**
The Result of λ *Max*= 12.162 ; *CI*= 0.116 ; *CR*= 0.077												

In another way, it can be proven that the results from Table 4a which have been calculated using mathematical algebra matrices can be retested using an Expert choice application, if indeed the results are the same, it means that the calculation process using mathematical algebra matrices can be recognized as true, pay attention to the results obtained using Expert choice application which can be seen in Table 4b as data entry pairwise matrices through the Expert choice application, while Fig. 2 describes the eigenvector results obtained through the Expert choice application. The results of both turned out to be acceptable on the grounds that the resulting eigenvector values have the same results. The difference between the two methods is that when using mathematical algebra matrices, it can be proven by the Consistency ratio (CR) which results in less than 10 percent, while in the Expert choice application, only by entering pairwise matrices data and the results of the eigenvector values can be generated automatically.

Table 4b. Pairwise matrices using Expert choice Application

Compare the relative importance with respect to: Goal: SmartPhone Main Criteria

	Operating System	Processor	RAM	ROM	Back Camera	Front Camera	Baterray	External Memory	Screen Size	Weight	Price
Operating System		2.125	2.352	2.735	2.372	3.223	3.121	4.105	3.034	2.422	2.371
Processor Speed			2.063	2.362	2.436	2.347	3.034	3.142	3.268	2.046	2.042
RAM				2.042	2.302	2.435	2.554	2.563	2.945	3.032	2.047
ROM					2.034	2.153	2.237	2.225	3.035	3.023	3.214
Back Camera						2.342	2.326	2.043	3.055	3.026	2.425
Front Camera							2.045	2.138	3.042	2.162	2.133
Baterray								3.033	2.136	2.034	3.201
External Memory									2.302	2.022	2.043
Screen Size										3.163	3.115
Weight											3.001
Price	Incon: 0.08										

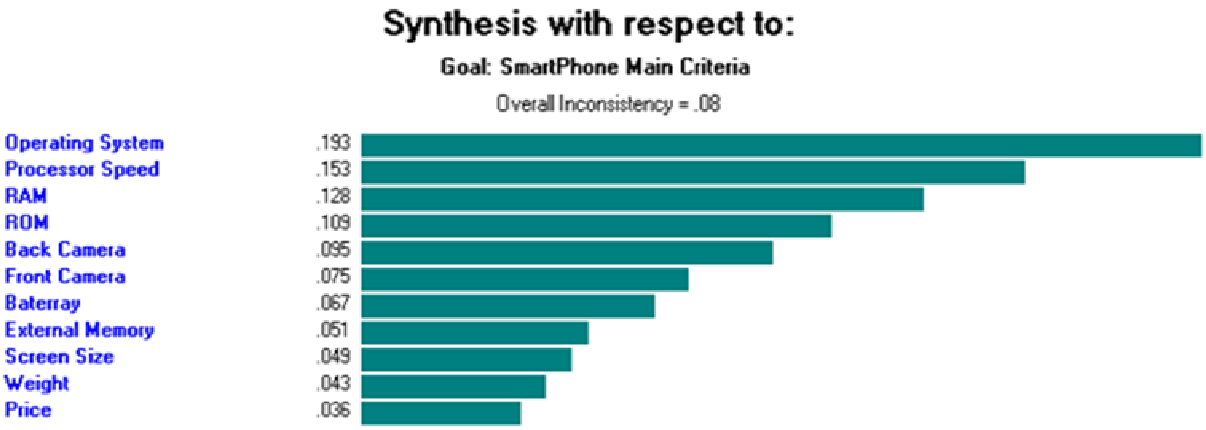

Fig. 2. The Result of Eigenvector using Expert Choice Application

The calculation process in Table 4a is used to determine the magnitude of the eigenvector value by multiplying the matrices by itself as follows AxA=B, where matrix A is multiplied by matrix A and

*name of corresponding author

the result is stored in matrix B. Then BxB=C and so on. Matrices B and matrices C are the result of multiplying matrices. The eigenvector value is the reduction of the difference between the results of the product of the last matrices and the previous matrices. If there is still a difference in the subtraction of the results of the multiplication of matrices, then it must be done as before and if you have not found the value of the difference in subtraction from the results of the multiplication of the next matrices, it can be said that you have found the optimal eigenvector value.

Then the results of the eigevector values can be tested by multiplying the initial matrices with the optimal eigenvector value, the results of which are stored in a matrix with the order value at the end of the multiplication matrices hand. From the results of the multiplication of the matrices, we will find the eigenvector by performing a division operation between the result of the multiplication of the matrices and the optimal eigenvector value which is averaged as the Lambda Max dimension. The key to the acceptance of a provisional decision is the CI which can be seen in equation 2 with the final value of the provisional decision determined by CR as shown in equation 3. Accepting or rejecting a decision the CI value must be less than 10 percent. This is the measure of an acceptable decision.

Thus, it can be shown that the final result of a pairwise matrix against the criteria values described in Table 4 shows that there are five iterations of the multiplication matrices outside the initialization matrices and the CR value obtained is 0.077 that the optimal eigenvector value can be used to be applied to the WSM method and the WP method. The use of weights using the WSM method can be applied directly by neglecting the multiplication between the value of the criteria for each alternative and the weight of each criterion that has been determined. The results obtained through the WSM method can be seen in Table 5 using formula 4 and formula 5.

Table 5. Calculation accumulation of WSM method

Nama SmartPhone	C1 (B) 19.3	C2 (B) 15.3	C3 (B) 12.8	C4 (B) 10.9	C5 (B) 9.5	C6 (B) 7.5	C7 (B) 6.7	C8 (B) 5.1	C9 (B) 4.9	C10 (C) 4.3	C11 (C) 3.6
Samsung Galaxy A3	0.99	0.92	0.19	1.74	1.23	0.37	155.11	13.14	0.23	5.71	0.10
Samsung Galaxy J7 Prime	1.16	1.96	0.39	3.48	1.23	0.60	222.55	13.14	0.27	7.23	0.12
Xiaomi Mi 4C	0.99	1.41	0.26	1.74	1.23	0.37	207.71	0.00	0.25	5.71	0.05
Xiaomi Mi Max	1.16	1.41	0.39	3.48	1.52	0.37	327.08	13.14	0.32	8.78	0.09
Asus Zenfone Max ZC550KL	0.97	0.73	0.26	3.48	1.23	0.37	337.19	3.28	0.27	8.74	0.07
Asus Zenfone 2 ZE551ML	0.96	1.41	0.51	3.48	1.23	0.37	202.32	13.14	0.27	7.36	0.12
Lenovo Vibe K5 Plus	0.97	1.65	0.26	1.74	1.23	0.37	185.46	1.64	0.25	0.22	0.08
Lenovo Vibe Shot	0.97	1.65	0.39	3.48	1.52	0.60	202.32	13.14	0.25	0.22	0.12

The final result of the sum of each criterion for each alternative can be seen in Table 6, which is shown in the original unsorted table condition and rounded up the result values.

Table 6. Vector Si WSM

Nama SmartPhone	Vector Si WSM	Ranking
Samsung Galaxy A3	168	8
Samsung Galaxy J7 Prime	237	3
Xiaomi Mi 4C	208	6
Xiaomi Mi Max	340	1
Asus Zenfone Max ZC550KL	339	2
Asus Zenfone 2 ZE551ML	216	5
Lenovo Vibe K5 Plus	193	7
Lenovo Vibe Shot	224	4

While the WP method that is considered for comparison with the WSM method becomes a calculation that will be compared in a different way, will it give the same results in decision support, the results of calculations with the WP method can use equation 6 and equation 7, with results that can be seen in Table 7.

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Table 7. Calculation of WP method

Nama SmartPhone	C1 (B) 19.3	C2 (B) 15.3	C3 (B) 12.8	C4 (B) 10.9	C5 (B) 9.5	C6 (B) 7.5	C7 (B) 6.7	C8 (B) 5.1	C9 (B) 4.9	C10 (C) 4.3	C11 (C) 3.6
Samsung Galaxy A3	1.37	1.32	1.05	1.35	1.28	1.13	1.69	1.33	1.08	1.24	1.04
Samsung Galaxy J7 Prime	1.41	1.48	1.15	1.46	1.28	1.17	1.73	1.33	1.09	1.25	1.04
Xiaomi Mi 4C	1.37	1.40	1.09	1.35	1.28	1.13	1.72	0.00	1.08	1.24	1.01
Xiaomi Mi Max	1.41	1.40	1.15	1.46	1.30	1.13	1.77	1.33	1.10	1.26	1.03
Asus Zenfone Max ZC550KL	1.36	1.27	1.09	1.46	1.28	1.13	1.78	1.24	1.09	1.26	1.03
Asus Zenfone 2 ZE551ML	1.36	1.40	1.19	1.46	1.28	1.13	1.72	1.33	1.09	1.25	1.05
Lenovo Vibe K5 Plus	1.36	1.44	1.09	1.35	1.28	1.13	1.71	1.19	1.08	1.07	1.03
Lenovo Vibe Shot	1.36	1.44	1.15	1.46	1.30	1.17	1.72	1.33	1.08	1.07	1.04

For the calculation of the Si vector using the WP method, this is the last result that can be compared with the previous method, while the final result of the WP method is measured based on the WP vector which can be seen in Table 8 in the form of the original result and has not been sorted in the rounded value of the results.

Table 8. Vektor Si from Weight Product

Nama SmartPhone	Vector Si	Ranking
Xiaomi Mi Max	9.76	3
Asus Zenfone Max ZC550KL	9.41	6
Samsung Galaxy J7 Prime	9.79	2
Lenovo Vibe Shot	9.89	1
Asus Zenfone 2 ZE551ML	9.66	4
Xiaomi Mi 4C	8.18	8
Lenovo Vibe K5 Plus	9.53	5
Samsung Galaxy A3	9.32	7

The results of the comparisons that have been made through the two methods of WSM and WP give the same results even though the values obtained have different values, because of course it is a good thing in the process of comparing the results of these two methods. The two methods, both WSM and WP, have similarities in the scope of grouping, both of which are part of a rating system called the Multi-criteria Decision Analytic (MCDA) which of course has the same data in determining the rating weights, so that things like this can be proven true through research. This is in the form of a comparison of evaluation and selection of electronic goods in the form of a SmartPhone and this is proven implicitly which can be seen from the magnitude of the vector values generated from each method. These results can be shown in Table 9.

Table 9. Results of Comparison of SmartPhone Evaluation and Selection with WSM and WP methods

Nama SmartPhone	Vector WSM	Vector WP	Average Weight	Ranking
Xiaomi Mi Max	340	9.76	175	1
Asus Zenfone Max ZC550KL	339	9.41	174	2
Samsung Galaxy J7 Prime	237	9.79	124	3
Lenovo Vibe Shot	224	9.89	117	4
Asus Zenfone 2 ZE551ML	216	9.66	113	5
Xiaomi Mi 4C	208	8.18	108	6
Lenovo Vibe K5 Plus	193	9.53	101	7
Samsung Galaxy A3	168	9.32	89	8

*name of corresponding author

CONCLUSION

The results of the discussion on the comparison of the two methods, namely the Weight Sum Model (WSM) and Weight Product (WP) with a weight approach using the Analytic Hierarchycal Process (AHP) method, provide evidence with optimal results, that the process of comparing evaluation and selection of electronic goods in the form of a SmartPhone through a long stage, providing satisfactory results in decision support for determining the rating of SmartPhones with the same decisions in the rating system based on the resulting Vector Si value, namely the SmartPhone product in the first position is the Xiaomi Mi Max with an average weight of 175 and followed by consecutively onwards by Asus Zenfone Max ZC550KL (174), Samsung Galaxy J7 Prime (124), Lenovo Vibe Shot (117), Asus Zenfone 2 ZE551ML (113), Xiaomi Mi 4C (108), Lenovo Vibe K5 Plus (101), and finally the Samsung Galaxy A3 (89). Judging from the results, the combination method between AHP, WSM and WP methods can provide the best solution with good results for decision-making support through evaluation and selection comparisons in the form of a SmartPhone with optimal results.

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