

# **Analysis of Internet Service Provider Selection Using the Analytical Hierarchy Process (AHP) and Simple Additive Weighting (SAW) Methods**

## **Abstract**

Currently, the need for internet connection is increasing due to the human need for information and communication that can be obtained through the internet. However, it is difficult for consumers to make decisions because of the many choices offered by internet service provider companies. So far, consumers have chosen providers based on information from various sources. Therefore, the availability of a system that helps make decision support is expected to help in choosing the desired or required internet service package. A decision support system with many criteria is needed to solve the challenge of choosing an internet package, which has many components or criteria that must be evaluated. Analytical Hierarchy Process (AHP) and Simple Additive Weighting (SAW) are two multi-criteria decision support system techniques, but they both use different measurement techniques. The aim of this research is to identify the best Internet Service Provider by applying the Simple Additive Weight (SAW) and Analytic Hierarchy Process (AHP) techniques. The objects used in this research are the providers Indihome, Biznet, and Solnet. The weight of each criterion is determined using the AHP technique, and the best suppliers are ranked using the SAW approach. The sampling technique used in this research was Purposive Sampling. The author uses a questionnaire data collection technique in the form of Google Form. In this study, the ranking results of 100 respondents showed that the ranking for the AHP method was 60% and for the SAW method was 92%. Thus, global calculations using the AHP and SAW methods were obtained for the best alternative ISP, namely Indihome.

## **Keywords:**

Analytic Hierarchy Process, Simple Additive Weight, Internet Service Provider.

## **Introduction**

Internet technology has brought many changes to developed countries. In Indonesia itself, the internet has had a big impact on the progress of developing countries. Then came the digital economy, the industrial revolution, education, and major cultural shifts. As a result, businesses, governments and society as a whole are increasingly dependent on the internet to meet their various daily needs and demands (Cakranegara & Rahadi, 2019). With the increasing need for internet network services in Indonesia every year, many Internet Service Provider markets are competing to offer a variety of internet packages and services that are attractive to consumers. According to research conducted by Velte et al. (2008) Internet Service Providers act as intermediaries between users and the global internet, enabling users to connect to internet networks and access various online services.

According to previous research conducted by Aritonang & Cahyadi (2023) stated that nowadays, internet services can be available in various places, which makes it easier for people to use them for daily online activities wherever they want. Choosing the internet service provider to use ultimately meets your needs. There are services with relatively expensive prices but good quality, or services with relatively affordable prices but not too high bandwidth. These various advantages will make it more difficult for users to choose which internet service they will use. The solution to help people choose internet services is to use the Analytical Hierarchy Process (AHP) as a decision support system. The Analytical Hierarchy Process (AHP) method is used to

calculate the priority order of the main criteria: price 39%, bandwidth 31%, and service 29%. For alternative rankings, Indihome 33%, Firstmedia 23%, Biznet 21%, and Oxygen 21%.

Several other high-speed Internet Service Providers with the latest technology available in Indonesia such as; Biznet high-speed internet provider with TV services; Solnet which provides unlimited internet packages; IndiHome which provides internet services and telecommunications services and Republikku offers cheaper prices compared to other internet service providers, speeds varying from 50Mbps to 300Mbps.

To meet your needs, several of the providers above offer services at competitive prices and speeds. The large number of choices makes it difficult for consumers to decide. Apart from that, the competitive dynamics of the internet service provider market also mean that consumers have to face constant changes in the internet services offered. Sometimes, companies will introduce special offers or promotions that further confuse consumers in their decision making. This complexity can cause consumers to feel confused, unsure, or even regretful after choosing a particular Internet Service Provider. Apart from that, mistakes in choosing an Internet Service Provider can result in inefficient expenses and an unsatisfactory internet experience.

This complexity is overcome by multi-criteria decision analysis, carried out by Analytical Hierarchy Process (AHP) and Simple Additive Weighting (SAW). Research by Dr. rer. Nat. Dittit Nugeraha Utama, (2017, bk. 114) suggests that the Analytical Hierarchy Process (AHP) allows people to organize and compare various criteria in a hierarchy, while according to research by Maryani et al. (2020, pt. Fisburn & MacCrimmon (2017) states that Simple Additive Weighting (SAW) uses a criteria weight ranking approach. These two methods help make a smarter choice when choosing an Internet Service Provider.

Additionally, research by Filipa Stephani Medyati, Marisi Aritonang (2019) found that Thomas L. Saaty created the Analytical Hierarchy Process (AHP) method as a tool to assist decision making, and also to enable decision making about how to organize complex problems into an integrated structure or series of levels. On the other hand, the Simple Additive Weighting (SAW) method calculates the weighted sum of the performance values of each option for each criterion. Therefore, these two methods are needed to complete the Internet Service Provider selection process which is intended to help make multi-criteria decisions.

In the process of selecting an Internet Service Provider, this research aims to apply and compare the Analytical Hierarchy Process (AHP) and Simple Additive Weighting (SAW) methods. Thus, we will find out how these two methods can help potential customers make choices that are more in line with their wishes. Additionally, this research will teach internet service providers about the elements that are most important to customers when selecting an Internet Service Provider. Service providers can use this information to improve their offerings and better understand their customers' needs.

With this background, this research entitled Analysis of Internet Service Provider Selection Using the Analytical Hierarchy Process (AHP) and Simple Additive Weighting (SAW) Method, is expected to provide a better solution in the Internet Service Provider selection process which will ultimately increase customer satisfaction and cost efficiency.

## Research methods

The Internet Service Provider selection process will be analyzed using quantitative descriptive research using the Analytical Hierarchy Process (AHP) and Simple Additive Weighting (SAW) methodology. The information collected for this research will relate to the standards and options used when selecting an Internet service provider. Each of these variables is measured using a Likert scale, for example the value ranges from 1 to 10 in the Simple Additive Weighting (SAW) method.

**Table 1.** Research Indicators

Research Concept	Indicators/Criteria	Scale
Selection of Internet Service Provider	Connection Speed	Likert
	Network Reliability	Likert

	Prices and Service Plans	Likert
	Quality of Customer Service	Likert
	Coverage Area	Likert
	Network Security	Likert
	Customer Satisfaction	Likert

The type of data used in this research is known as primary data, according to Dr Sugiyono (2019, p. 225). Questionnaires distributed to respondents are used to obtain the information they need. The data source for this research is the general public of Batam City who were respondents to answer statements from the questionnaire that generally the public understands and uses internet services. The object of the research is the general public using Internet Service Provider Broadband services who live in the Batam City area. Because the population size is unlimited or unknown, the Lemeshow formula is the method used to calculate the number of samples that will be used in this research. With the following formula, the sample size is as follows:

$$n = \frac{Z^2 \cdot 1 - \alpha / 2p(p-1)}{d^2} \quad (1)$$

$$n = \frac{1,96^2 \times 0,5(1-0,5)}{0,1^2}$$

$$n = \frac{3,8146 \times 0,25}{0,01}$$

$$n = 96,04 = 100$$

Sugiyono (2012), the sample is a component of the total population and its characteristics. The sampling process must truly be used as an illustration or representation of the actual condition of the population. The purposive sampling method, which takes samples based on certain considerations, was used in this research. The considerations used to become respondents are:

1. Respondents aged <24 years to >40 years (minimum 18 years and maximum 50 years), because at this age respondents can provide accurate and reliable data.
2. Respondents are Internet Provider Broadband service users
3. Respondents live in the Batam City area.

The Analytical Hierarchy Process (AHP) approach was developed in 1970 by Thomas L. Saaty, a mathematician from the University of Pittsburgh in the United States. This decision support model will provide an explanation of the elements, further criteria, or multifactorial complexity arranged in a hierarchy. Reassessment needs to be done if the CR value is more than 0.1. The CR formula is:

$$CR = \frac{CI}{RI} \quad (2)$$

Information:

CR = Consistency Ratio

R.I = Index Random

Consistency Ratio value (CR) and Consistency Index (CI) were calculated to test the Analytical Hierarchy Process (AHP) approach.

Method *Simple Additive Weighting* (SAW) also called the weight addition method finds the total weight by calculating the ranking for each option over all criteria Kusumadewi & Hartati (2007). The choice matrix (X) must be normalized in the Simple Additive Weighting (SAW) approach to a scale that can be compared with all currently existing alternative symbols. This approach only performs one normalization step using a matrix consisting of rows and columns. The formula to get this normalization is:

$$R_{ij} = \quad (3)$$

$$\left\{ \begin{array}{l} \frac{x_{ij}}{\max_i x_{ij}}, \text{ if } i \text{ (benefit)} \\ \frac{\min_i x_{ij}}{x_{ij}}, \text{ if } j \text{ (cost)} \end{array} \right.$$

$R_{ij}$  is the normalized performance rating of alternative (provider)  $A_i$  in attribute  $C_j$ ;  $i=1,2,\dots,m$  and  $j=1,2,\dots,n$ . The following is the preference value ( $V_i$ ) for each alternative:

$$V_i = \sum_{j=1}^n (W_{ij} R_{ij}) \quad (4)$$

Information:

$V_i$  = Ranking for each alternative

$W_j$  = Weight value in each criterion

$R_{ij}$  = Normalized performance value

The final result of the ranking procedure is obtained by multiplying the weight vector by the normalization matrix R, with the largest value selected as the optimal answer.

## Results and Discussion

Respondents are described through descriptive analysis into many attributes. Participant attributes in this study were divided into five categories: 1. Age, 2. Gender, 3. Employment Status, 4. Income, and 5. Duration of use of the internet provider.

**Table 2**  
Descriptive Analysis of Respondents

No.	Description	Frequency	Percentage
1.	Gender		
	Man	52	52
	Woman	48	48
2	Age		
	18 – 24	32	32
	24 – 25	35	35
	26 – 35	27	27
	36 – 40	4	4
	40 – 50	2	2
3	Employment Status		
	Private sector employee	75	75
	Civil servants	12	12

	Businessman	13	13
4	Income		
	< 3,000,000	6	6
	3,000,000 – 5,000,000	51	51
	5,000,000 – 10,000,000	37	37
	>10,000,000	6	6
5	How long to use ISP services		
	<5 years	19	19
	>5 years	81	81

Based on the table above, it can be seen that the characteristics of respondents in terms of gender include women (48%) and men (52%). The characteristics of respondents based on age are dominated by those aged 24-25 years, namely 35%, followed by 18-24 years (32%), then 26-35 years (27%), 36-40 years (4%) and finally 40-50 years (2%). In terms of employment status, respondents are still dominated by private sector employees at (75%), followed by entrepreneurs at (13%) and TNI/Polri/PNS at (12%). This is also related to the characteristics of respondents based on income which is dominated by respondents with an income of IDR 3 – 5 million (51%), followed by respondents with an income of IDR 5 – 10 million (37%), and respondents with an income of < IDR 3 million and > Rp. 10 million each amounting to (6%). Then for how long respondents have used internet service provider services, it is dominated by respondents who have used it for more than 5 years, namely (81%), while the remainder (19%) are respondents who have used it for less than 5 years.

## 1. Analytical Hierarchy Process (AHP) Method

AHP method steps:

1. Comparison value between criteria

**Table3**  
Pairwise Comparison Matrix

	A	B	C	D	E	F	G
Connection Speed (A)	1.00	2.30	3.25	2.00	2.25	0.28	0.38
Network Reliability (B)	0.43	1.00	2.25	0.39	3.52	0.25	0.40
Prices and Service Packages (C)	0.31	0.44	1.00	0.29	0.31	0.23	0.29
Customer service quality (D)	0.50	2.59	2.00	1.00	3.05	0.25	0.25
Coverage Area (E)	0.44	0.28	3.27	0.33	1.00	0.23	0.27
Network Security (F)	3.62	3.00	4.40	4.07	4.30	1.00	3.25
Customer Satisfaction (G)	2.50	2.51	3.45	3.77	3.77	0.31	1.00
Total	8.81	12.13	19.61	11.84	18.19	2.54	5.83

Table 3 shows the results of measuring the priority of importance of criteria in selecting ISP services. These results were obtained from geometric calculations of average data from one hundred participants. According to the comparison matrix, the best criterion from each criterion column is the value with the highest weight for each row. A value with a weight of one is a balanced pairwise comparison. Like connection speed and network constraints, connection speed is more important than network reliability.

## 2. Priority Weight Calculation Between Criteria (Level 1)

Table 4.2 shows the comparison of assessments between criteria. Next, the value of each cell is divided by the number of values in each column to perform normalization. Calculating Priority Weight calculates the average value or weight of each criterion. If the sum of the weight values or the average of all criteria is 1, then the weight calculation is correct. The following is an example of calculating priority weight for each criterion:

$$\text{Calculation for Connection Speed – Speed} = \frac{\text{Cell Value}}{\text{Column Total Value}} = \frac{1}{453} = 0,11 \quad (5)$$

$$\text{Calculation for Connection Speed – Reliability} = \frac{\text{Cell Value}}{\text{Column Total Value}} = \frac{2.30}{12.13} = 0,19 \quad (6)$$

$$\text{Calculation of Priority Weight for Speed} = \frac{\text{Total Value}}{n} = \frac{0.93}{7} = 0.13 \quad (7)$$

$$\text{Calculation of Priority Weight for Reliability} = \frac{\text{Total Value}}{n} = \frac{0.64}{7} = 0.09 \quad (8)$$

Following This is the result of the priority weight between the criteria which will be presented in table 4.4:

**Table 4**  
Calculation Priority Weight between Criteria

	A	B	C	D	E	F	G	Total	Weight
Connection Speed (A)	0.11	0.19	0.17	0.17	0.12	0.11	0.06	0.93	0.13
Network Reliability (B)	0.05	0.08	0.11	0.03	0.19	0.10	0.07	0.64	0.09
Prices and Service Packages (C)	0.03	0.04	0.05	0.02	0.02	0.09	0.05	0.30	0.04
Customer service quality (D)	0.06	0.21	0.10	0.08	0.17	0.10	0.04	0.76	0.11
Coverage Area (E)	0.05	0.02	0.17	0.03	0.05	0.09	0.05	0.46	0.07
Network Security (F)	0.41	0.25	0.22	0.34	0.24	0.39	0.56	2.41	0.34
Customer Satisfaction (G)	0.28	0.21	0.18	0.32	0.21	0.12	0.17	1.48	0.21
SOR	1.00	1.00	1.00	1.00	1.00	1.00	1.00	3.00	1.00

Priority weight calculations must be normalized first, namely by dividing the value of each cell by the appropriate number of columns and then averaging each row. Based on the results of the priority weight calculation, the criteria obtained are those in the first priority, namely the network security criteria with a weight of 0.34, for the second priority, namely customer satisfaction with a weight of 0.21, then for the third priority, namely the connection speed criterion with a weight value of 0.13. Calculation of Consistency Ratio and Consistency Index (CR and CI/ By dividing each element into the number of columns in question, a normalized relative weight is obtained. The eigenvector value is obtained from the average relative weight for each row.

The consistency index value, which comes from a matrix of order seven, is as follows:

$$CI = \frac{\lambda_{max} - n}{n - 1} = \frac{7.73 - 7}{7 - 1} = 0.12 \quad (9)$$

$$n = 7, RI = 1.32$$

$$CR = \frac{CI}{RI} = \frac{0.12}{1.32} = 0.09 \quad (10)$$

Because  $CR < 0.10$  indicates that the respondent's preferences are consistent with consistent testing, weighting is no longer necessary.

The calculation results shown in the table above show that network security criteria are the most important for respondents consisting of private employees, entrepreneurs and civil servants, with a value of 0.35 or 35%. The customer satisfaction criterion is in second place with 0.22 or 22%, the network speed criterion with a value of 13%, the customer service quality criterion with a value of 0.11 or 11%, and the network reliability criterion with a value of 0.11 or 11%. Next, the coverage area criteria with a weight of 0.06 or 6%, then the price and service package criteria with a weight of 0.04 or 4%.

### 3. Calculation of Criteria Evaluation Factors

#### a. Calculation of Evaluation Factors for Speed Criteria

**Table5.**

Pairwise Comparison Assessment Results Matrix for Normalized Internet Speed Criteria

Alternatives	Indihome	Biznet	Solnet	Total	Eigen
Indihome	0.60	0.65	0.51	1.66	0.59
Biznet	0.23	0.25	0.35	4.00	0.28
Solnet	0.16	0.10	0.14	7.17	0.13

#### b. Calculation of Evaluation Factors for Network Constraints

**Table6**

Pairwise Comparison Assessment Results Matrix for Normalized Network Reliability Criteria

Alternatives	Indihome	Biznet	Solnet	Total	Eigen
Indihome	<b>0.63</b>	<b>0.71</b>	<b>0.40</b>	<b>1.56</b>	<b>0.58</b>
Biznet	<b>0.18</b>	<b>0.24</b>	<b>0.46</b>	<b>4.23</b>	<b>0.29</b>
Solnet	<b>0.18</b>	<b>0.06</b>	<b>0.13</b>	<b>7.55</b>	<b>0.12</b>

#### c. Calculation of Evaluation Factors for Prices and Service Packages

**Table7**

Pairwise Comparison Assessment Result Matrix for normalized Price and Package Criteria

Alternatives	Indihome	Biznet	Solnet	Total	Eigen
Indihome	0.64	0.71	0.40	1.56	0.60
Biznet	0.18	0.24	0.46	4.23	0.28
Solnet	0.18	0.06	0.13	7.65	0.12

#### d. Calculation of Evaluation Factors for Customer Service Quality

**Table8**

Pairwise Comparison Assessment Results Matrix for Customer Service Quality

Alternatives	Indihome	Biznet	Solnet	Total	Eigen
Indihome	0.64	0.72	0.47	1.56	0.61
Biznet	0.18	0.22	0.40	4.48	0.27

Solnet	0.18	0.05	0.13	7.45	0.12
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e. Calculation of Evaluation Factors for Coverage Area

**Table9**  
Pairwise Comparison Assessment Result Matrix for Normalized Coverage Area Criteria

Alternatives	Indihome	Biznet	Solnet	Total	Eigen
Indihome	0.66	0.67	0.38	1.51	0.57
Biznet	0.15	0.27	0.52	3.71	0.31
Solnet	0.18	0.06	0.11	9.33	0.12

f. Calculation of Evaluation Factors for Network Security

**Table10**  
Pairwise Comparison Assessment Results Matrix for Normalized Network Security Criteria

Alternatives	Indihome	Biznet	Solnet	Total	Eigen
Indihome	0.64	0.73	0.48	1.57	0.62
Biznet	0.19	0.22	0.39	4.60	0.27
Solnet	0.17	0.05	0.13	7.74	0.12

g. Calculation of Evaluation Factors for Customer Satisfaction

**Table11**  
Pairwise Comparison Assessment Results Matrix for Normalized Network Security Criteria

Alternatives	Indihome	Biznet	Solnet	Total	Eigen
Indihome	0.64	0.73	0.38	1.56	0.58
Biznet	0.17	0.22	0.47	4.51	0.29
Solnet	0.19	0.05	0.15	6.85	0.13

Because each criterion has a  $CR < 0.10$ , it means that the respondent's preferences are consistent. with consistent testing, there is no need for recalculation of weighting.

4. Total Ranking Alternative Calculation (Provider)

After processing the data using AHP, the final result was obtained, namely determining the best internet service provider used by the community, namely Indihome with a score of 0.60 or 60% for all criteria.

**Simple Additive Weighting(PBUH)**

Because the SAW method does not offer pairwise comparisons for calculating weights, an approach similar to the AHP method is used to calculate priority weights for each criterion and sub-criteria and calculate evaluation factors for each alternative.

Through calculations using the previous AHP method, the priority weight for network security criteria was obtained with a value of 0.612 or 61.2%. The results of research and direct research at the location carried out by researchers determine the weight of this criterion. Criteria that indicate the greatest profit or value for the company are referred to as profits, and criteria that indicate a loss or small value are referred to as losses.

The following is the process of calculating the preference value ( $V_i$ ) for each choice by multiplying the normalized matrix ( $R$ ) by the weight vector ( $W$ ). To obtain a ranking, the criteria weights ( $W$ ), normalization results ( $R$ ), and total results for each alternative are multiplied in a matrix. The best choice is the one with the highest overall value.

$$W = (0.4|0.1|0.1|0.2|0.2) \text{ matrix}$$

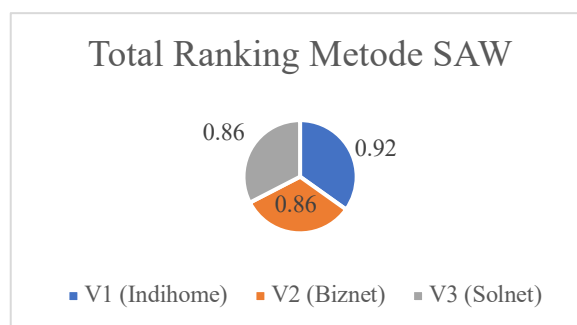
	Alternative (Provider)	Weight	Ranking	Percentage
0.92	V1 (Indihome)	0.92	I	92%
0.86	V2 (Biznet)	0.86	II	86%
0.86	V3 (Solnet)	0.86	III	86%

Based

on the findings of these calculations, it can be determined that option V1, which has a value of 0.2—the maximum value that a featured provider can have—has the highest preference value when choosing an internet provider.

**Table12**  
Total Ranking

Alternative (Provider)	Weight	Ranking	Percentage
V1 (Indihome)	0.92	I	92%
V2 (Biznet)	0.86	II	86%
V3 (Solnet)	0.86	III	86%



**Picture1.**Total Ranking SAW method

a. Comparison of AHP and SAW Methods

The ranking results of the SAW technique and the AHP method show several similarities based on the simulations used to evaluate both approaches

**Table13**  
Comparison of AHP and SAW Methods

Based on the results of research comparing the SAW and AHP methods in making decisions to determine the best provider, it can be concluded that the calculation results of the SAW and AHP methods have the same ranking. The two alternatives with the

greatest value are the selected providers. The three best providers according to the AHP and SAW methods are Indihome with weights of 60% and 92% respectively.

Based on these findings, it can be said that the SAW approach only considers factors in choosing the best service. A measurement scale and a way to obtain priorities (weights) for the entire hierarchy of criteria and alternatives (providers) must also be provided with the AHP technique in order to identify the best provider. This is done by grouping criteria and alternatives (providers) and carrying out pairwise comparisons.

The consistency ratio (CR) of the AHP technique for calculating weights is related to the criteria weights. Weights should not be used if the value is more than 0.1 because it indicates that the criteria weights are inconsistent. Meanwhile, determining the weights of the SAW approach only takes into account the weights of the criteria which need to be normalized or if combined the result is equal to 1. Therefore, using the AHP technique in choosing an internet service provider is more successful because it allows you to learn what factors, such as security and network speed, which users prioritize when choosing an ISP.

This is in accordance with the results of research which states that Pawestri & Widya Sihwi (2016) found that the application of the AHP technique is more suitable for case studies of selecting internet service packages based on the results of calculations carried out using the SAW method and the AHP method. AHP is considered a suitable representation of natural thinking, which tends to group system elements into different levels, each level containing similar elements and also providing a measurement scale and method for deriving priorities. This internet service package is selected based on a number of sub-criteria. because the priority of each criterion is different-different.

### **Selection of Internet Service Provider using the AHP Method**

Based on the results of data processing using the AHP method, network security criteria are the most important criteria for respondents consisting of private employees, entrepreneurs and civil servants with a weight of 0.35 or 35%, next is customer satisfaction with a weight of 0.22 or 22%, network speed criteria with a weight of 13%, customer service quality criteria with a weight of 0.11 or 11%, network reliability criteria with a weight of 0.11 or 11%, then coverage area criteria with a weight of 0.06 or 6%, then price and service package criteria with a weight of 0.04 or 4%. This is in line with research from Kurniawan et al. (2024) which states that network security must be considered considering the increasing number of internet users to protect them from careless parties. Although home networks may host various cyber threats, such as malware attacks, viruses, brute force attacks, phishing, ransomware, and website defacement, many people often neglect network security in these circumstances.

For alternatives (providers), 100 respondents chose the best Indihome provider. In accordance with the AHP weights, the final result is the determination of the best internet service provider used by the public, namely Indihome with a score of 0.60 or 60% for all criteria. In accordance with the results of research which states that (Resti, 2024) The results of testing the AHP method show that the provider most recommended to potential customers is the IndiHom provider.

## **Selection of Internet Service Provider using SAW**

Based on the results of questionnaire calculations carried out on one hundred participants using the SAW method, it was found that alternative V1 had the highest preference value for choosing an internet provider, with a value of 92% which is the highest value for a superior internet provider. In line with research (Zabar & Novianto, 2015) which states that the research results show that the consistency ratio value of 0.0794 is lower than the consistency ratio value used, which shows that the calculation results are valid and can be used. The results of this application support the decision that IndiHome is the best wireless provider for use in the home area.

## **Comparison from the Analytical Hierarchy Process (AHP) Method with the Simple Additive Weighting (SAW) Method**

Based on the comparison that has been carried out, it can be seen that the two AHP methods and SAW, produces the same ranking in determining the selection of the best provider. The comparison table shows that Indihome has the highest score with a weight of 60% in the AHP method and 92% in the SAW method. The SAW method only weights criteria, while the AHP method requires grouping criteria and alternatives and carrying out pairwise comparisons to get priorities. AHP also takes into account the consistency ratio (CR) in determining criteria weights. If the CR is more than 0.1, then the criteria weights are inconsistent and cannot be used. In contrast, the SAW method only requires normalized criteria weights with the sum result equal to 1. Thus, AHP is more effective in selecting internet service providers because it is able to determine the criteria prioritized by customers, such as security and network speed. This is consistent with research by Pahwestri & Widya, (2016) which states that AHP is more appropriate for case studies of selecting internet service packages which involve many sub-criteria, because AHP is able to group elements into different levels and provides a measurement scale for determining priorities. .

## **Conclusion**

From results Taking data analysis, it can be concluded as follows:

1. The results of using the Analytical Hierarchy Process (AHP) method show that the most important criteria according to respondents is network security with a weight of 0.35 or 35%, next is customer satisfaction with a weight of 0.22 or 22%, network speed criteria with a weight of 13%, service quality criteria customers with a weight of 0.11 or 11%, network reliability criteria with a weight of 0.11 or 11%, then coverage area criteria with a weight of 0.06 or 6%, then price and service package criteria with a weight of 0.04 or 4%. For alternatives (Provider), Indihome has the superior value, namely 60%, followed by Biznet and Solnet with values of 28% and 12% respectively.
2. The results of using the Simple Additive Weighting (SAW) method show that the highest preference value for selecting an Internet Service Provider is alternative V1 (IndiHome) with

a value of 92%, which is the maximum value where there is a superior Internet Service Provider. V2 (Biznet) with a score of 86% and V3 (Solnet) with a score of 86%.

3. From the results of the comparison of the AHP and SAW methods in selecting an Internet Service Provider, it is known that the AHP method is more appropriate to use for making selection decisions. This is in accordance with the results of research from (Pahwestri & Widya, 2016) which states that using the AHP method is better at grouping elements into different levels and determining the priority of various criteria. In addition, AHP provides a measurement scale and an effective method for obtaining hierarchical priority criteria.

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