How is the Application of Analytical Hierarchy Process in Supplier Performance Assessment?

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Keywords: Decision Support System, Analytical Hierarchical Process, Supply Chain Operation Reference, Performance Assessment, Supplier.

Abstract: This study aims to measure supplier performance more accurately using the Analytical Hierarchical Process (AHP) method. The AHP method does the weighing and measurement of each evaluation criterion in the Performance Assessment of Decision Support System (DSS). This study took twenty suppliers samples consisting of ten local suppliers and ten national sample suppliers at Karsa Utama Lestari Ltd Gorontalo. This study is quantitative. We use the interview method to collect data. Besides, data analysis techniques use analytical descriptions. The results showed that the assessment using the AHP method had five main criteria, 16 sub-criteria, and 37 sub-criteria. Five main measures were taken in the process of the Supply Chain Operation Reference (SCOR) approach, such as reliability, responsiveness, coast, flexibility, and assets. Therefore, this method produces better performance measurements compared to conventional performance appraisal models because the results of supplier performance assessment can be observed quickly and precisely interpreted in a diagram on a computer.

1 INTRODUCTION

Suppliers are a crucial part of the supply chain. Suppliers also affect the activeness of a company. The accuracy in choosing suppliers can reduce purchasing costs, increase market competitiveness and increase product end-user satisfaction (Önüt et al., 2009).

A Trial is conducted on suppliers related to the information function between suppliers and companies (Hald and Ellegaard, 2011). Suppliers must continue to be monitored to have cooperation with the company and are always tracked at all times (Sellberf and Broman, 2000). According to Cousins et al. (2008), the method of Analyzing the Hierarchical Process (AHP) not only in terms of communication and operations but in terms of price and business can be used as a supplier or supplier assessment.

Karsa Utama Lestari Ltd has approximately 500 suppliers spread across parts of Indonesia. A large number of suppliers cause several problems to prioritize demand for certain goods. These problems are difficulties with significant demand for products, limited supply of goods from suppliers, and slow response from suppliers. This problem has a profound impact on company stability. Therefore, companies need a performance measurement system for suppliers. This system uses the Supply Chain Operations Reference model (SCOR). The SCOR approach is the main cafeteria at the company Karsa Utama Lestari Ltd. The SCOR approach aims to determine criteria and sub-criteria that are suitable for the company when the company selects the criteria for evaluating performance against suppliers.

The results of the performance measurement approach are measured based on criteria using the AHP (Analytical Hierarchy Process method) method. The function of this method is to determine the weights for each supplier's performance criteria and indicators. We developed a DSS system using the AHP method to measure the performance of each supplier more efficiently and to supervise suppliers who collaborate with the company. Besides, the company can control the amount of stock of goods if suppliers make delays in the supply of goods.

SCOR is effectively applied for evaluating supplier performance because SCOR has performance attributes (Team, 2006). Performance attributes are cell attributes that are used to assess supply chain processes from a variety of different perspectives. The SCOR method has five attributes to evaluate supply chain performance. Multiple metrics can be used as performance measurement metrics in one attribute.

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Based on (Karjalainen, 2012), performance improvement from suppliers requires a framework. AHP is used as an international supplier selection as a domain strategy model. Assessment criteria on the supplier's performance can be obtained based on the problems in the company. Supplier performance evaluation is very important for the sustainability of a company (Domier, 1998), and the concept of supply chain management (SCM) can overcome global competition between companies (Ahmad and Yuliawati, 2013). A standardized company is a company that can meet all market needs, meet the needs of each of its customers, incur low enough costs to stock products, manage industries more flexible.

The AHP model has several criteria, including quality, endurance test (Zahir, 2014). Other measures are a delivery process, price, response, business and stability, information about process development, technical capability, and excellent and stable background. In short, there are three criteria for the best suppliers to produce decisions in the selection of suppliers who can cooperate with the company. According to (Baily et al., 2005), an excellent supplier must deliver goods on time, remains consistent with the quality of an item, provides a much lower price or the best price, and has a stable background. Besides, the supplier must give after-sales service good, provide services to good inventory, conduct what will be done, and provide information on developments to consumers or companies.

This study uses the SCOR approach to decide the category and sub-category appropriating for the company. Besides, this study also uses the DSS method. DSS is an AHP method to measure the performance of suppliers results from the way to be used. Then the results can be seen to measure supplier performance. In this study, the main criteria used are those that are in the SCOR approach. The SCOR approach criteria are reliability, responsiveness, flexibility, coast, assets. Sub criteria are taken from the SCOR approach based on the main criteria located at PT. Karsa Utama Lestari. Besides, this study only reached the completion of level 1- Top-level (a type of process), because in this study only defines one of the five core management processes of the SCOR model, which is called source.

2 THEORY STUDY

2.1 Supplier

(Chopra and Meindl, 2007) suggested that the supply chain is a general description of how to manage an organization in terms of distributors, manufacturers, and consumers. The goal of the supply chain is to meet the needs and generate consumer profits. A performance attribute is a cell attribute to evaluate supply chain processes from a variety of different perspectives. Five attributes to assess supply chain performance are the use of performance attributes from the Supply Chain Operation Reference (SCOR).

Performance Attribute	Definition
Supply chain reliability	Supply chain performance in delivering the right product, the right time, the right place, the right amount, and well documented.
Supply chain responsiveness	The supply chain speed in providing products to consumers.
Supply chain flexibility	The supply chain ability to respond, market changes, and win the market competition.
Supply chain cost	Costs relating to supply a supply chain.
Supply chain asset management	The value of the effectiveness of an organization to manage its assets, to support demand satisfaction. It includes fixed capital and working capital.

Figure 1: Performance attributes.

2.2 Decision Support System

DSS was known in the early 1970s by Michael S. Scott, as the Management Decision System. DSS was a computer-based system to helps decision making by utilizing data and models to solve unstructured problems (Turban et al., 2005).

2.3 Analytical Hierarchy Process (AHP)

This method is used to decided effective decisions on complex problems. It began to simplify and speed up the decision making process by solving the problem into its parts, arranging variables in a hierarchical arrangement, giving a numerical value. To subjective considerations of the importance of each variable and synthesize is to consider and determine which variable has the highest priority and act to influence the outcome of the situation.

The AHP process can solve the problem in an organized frame of mind so that it can be expressed to make effective decisions on the problem. (Marimin, 2004). AHP method has ten advantages proposed by (Marimin, 2004), namely: (1). The AHP method has the advantage of dealing with a significant and unstructured problem into a model that is more flexible and easier to understand. (2) AHP is very complex, and this method overcomes very complex problems by using a system approach and integration by deduction. (3) influence each other, and this method is able

to be used on elements. It consists of free and do not require linear relationships. (4) hierarchical arrangement, in this method, is a representative of natural thinking, tending to group more system elements at different levels from each level that has the contents of similar elements. (5) having measurements, this method has an alternative measurement scale and methods for getting priority. (6) Consistent, the AHP method firmly maintains what is called logical consistency in carrying out assessments used to determine priorities. (7) Synthesis, AHP leads to overall thinking about what some of the alternatives want. (8) Bargaining, the purpose of bargaining in this method is that AHP takes priority seriously so that other people can choose the best alternative to achieve what they have designed. (9) Assessment and Consensus, this method does not require the presence of a counselor, but in this method, how to combine the results of different assessments. (10) Repetition of the process, the intention can make people able to filter the understanding of one problem and develop an assessment and understanding through the process of repetition.

List of random consistency index (IR) can be seen in the following table:

Matrix Size	Score RI
1, 2	0,00
3	0,58
4	0,90
5	1,12
6	1,24
7	1,32
8	1,41
9	1,45
10	1,49
11	1,51
12	1,48
13	1,56
14	1,57
15	1,59

Figure 2: Performance attributes.

2.4 Steps of the AHP Method

The steps in the AHP method include (Kusrini, 2007) as follows:

1. Define the problem and determine the desired solution, then arrange the hierarchy of the problem at hand. The hierarchy arranges to set goals, which are the overall system goals at a limited level.
2. Determine the priority of the element
   (a) The first step is to make a paired comparison, i.e., comparing the elements in pairs according to the given criteria.
   (b) Paired comparison matrices are filled using numbers to represent the relative importance of one element to the other elements.

   The comparison matrix can be seen in Figure 3, where this matrix explains the relative contribution or something that influences each element of the objectives or criteria.

C	A_1	A_2	A_3	.....	A_4
A_1	a_{11}	a_{12}	a_{13}	.....	a_{1n}
A_2	a_{21}	a_{22}	a_{23}	.....	a_{2n}
.....	.....	.....	.....	.....	.....
Aa	a_{a1}	a_{a2}	a_{a3}	.....	a_{an}

Figure 3: List of Random Consistency Indices (IR) Source: (Saaty, 1980).

3. Synthesis
   Considerations of pairwise comparisons are synthesized to obtain overall priority. The things done in this step are:
   (a) Add up the values of each column in the matrix
   (b) Divide each value from the column by the total column in question to obtain matrix normalization.
   (c) Add up the values of each row and divide by the number of elements to get the average value.
4. Measure consistency
   In making decisions, it is essential to know how the right consistency is because we do not want decisions based on considerations with low consistency. Things are done in this step:
   (a) Multiply each value in the first column by the relative priority of the second element, and so on.
   (b) Add up each row
   (c) The results of the row addition are divided by the relative priority element in question.
   (d) The number of quotient above with the number of elements available, the result is called max.
5. Calculate consistency index (CI) with the formula:

$$CI = \frac{\lambda maks - n}{n-1} \quad (1)$$

   Where:
   n = Number of elements
6. Calculate the consistency ratio (CR) with the formula:

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

   Where:
   CR = Consistency ratio
   CI = Consistency index
   IR = Index random consistency

7. Checking is the same as hierarchical consistency. If the value is more than 10%, then the judgment data must be improved. However, if the consistency ratio (CI / IR) is less or equal to 0.1, then the calculation results can be declared correct. A list of consistency random index (IR) can be seen in table 2.

3 METHOD

This study uses the Waterfall system development method (based on the waterfall stage in (Arbani et al., 2011)). The advantages of the waterfall include the process is easy to understand and clear and to manage the project. Besides, the document is generated in every phase; a phase is run after the previous period is complete; the system structure is transparent; user needs are well understood; the possibility of changes in user needs is slight. The sample of the study is twenty suppliers samples consisting of ten local suppliers and ten national sample suppliers at Karsa Utama Lestari Ltd Gorontalo.

3.1 Analysis and Definition

This stage carries out the process of analyzing the valuation model previously at Karsa Utama Lestari Ltd. After we decided on the subsequent analysis stage, We conducted a literature study and literature study. We make observations and interviews to obtain information and data needed in this study. Data referred to as the number of suppliers who have partnered with the company.

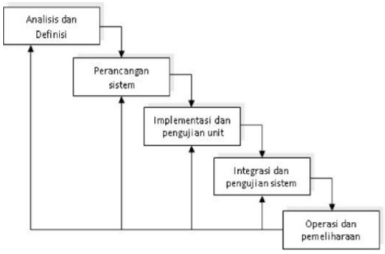

Figure 4: The stages in the waterfall

3.2 System Planning

The stages of system design are intended to design an information system design. The assessment process using AHP will be entered into a performance appraisal information system. Where at this stage, the application design will be made, and database design.

3.3 Unit Implementation and Testing

This stage will be carried out in the testing process. The system will be tested using black-box testing; the coding or program will be written before we translate the system process design into a language that is recognized by the computer. The programmer's tip does this stage, in which the programmer will explain the needs desired by a user into the form of a program.

3.4 System Integrity and Testing

This stage is the final stage in the application of the AHP method in a performance appraisal system. This stage will also make improvements if problems or deficiencies are found in the performance appraisal system.

3.5 Operation and Maintenance

Operation and maintenance is the last stage in the waterfall model because the maintenance process of the system used, and it has been applied to the decision support system (DSS) method.

4 RESULTS

The result showed that supplier performance appraisal is still less than optimal in terms of quality and time. Karsa Utama Lestari Gorontalo Ltd conducted to assess supplier performance every six months. The assessment result showed that the lack of optimality and effectively in terms of time because the supplier's performance evaluation uses the observation method without having detailed documentation.

The aimed of assessing the performance of suppliers is to get suppliers that have good quality, responsibility and can meet the needs of the company. The results of the data collection showed that the top 10 local and national suppliers could be seen in Figure 5. Data inputted on the system implementation is tested using manual calculations on Excel. The results displayed on the system implementation are the same as manual calculations so that the application created can view the results of supplier performance measurements using the AHP method appropriately. The assessment process of local suppliers and national suppliers on Karsa Utama Lestari Gorontalo Ltd still uses the observation evaluation model.

The traditional model does not have detailed documentation in the performance appraisal process of each supplier. The DDS method is the Analytical Hierarchy Process (AHP) method, which consists of 5

chief criteria, 16 sub-criteria, and 37 sub-criteria. The results of the assessment used the assessment method of AHP, which was made into two suppliers, local and national suppliers:

Supplier Local	Supplier Nasional
CV. Karsa Pangan Sejahtera	Borwita Citra Prima Ltd
CV. Manggala Utama	Indo Marko Ltd
CV. Marketindo	Fajar Lestapri Ltd
UD. Irama Lestari	Awet Sarana Sukses Ltd
Roki Wira Indo Prima Ltd	Rezky Farn Fasto Ltd
Sinsana Sejahtera Ltd	Asia Paramita Indah Ltd
UD. Cahaya Mitra Lestari	Marga Nusantara Ltd
UD. Cahaya Mitra Lestari	Marga Nusantara Ltd
UD. SuperTok	3 Raksa Satria Ltd
UD. Sehat Indah	Nutrifood Indonesia Ltd
CV. Multi Guna Hambali	Fontera Ltd

Figure 5: Local and national suppliers (Source: Interview with Director of Karsa Utama Lestari Gorontalo, 2015).

4.1 Analysis of the Calculation Process using the AHP Method

In the analysis of this process, the authors use the AHP method in completing calculations to measure supplier performance. All data, subcriteria, and sub-criteria are used to get the final result of this process. After obtaining the input data needed, the next step is to perform calculations using the AHP method. Some steps that must be done are:

4.1.1 Determine the Types of Criteria

In this study, the authors conducted studyat Karsa Utama Lestari Gorontalo Ltd in measuring supplier performance in determining supplier ranking, which will become a partner at Karsa Utama Lestari Gorontalo Ltd. The criteria that will be used in the assessment consist of 5 main criteria based on the SCORE approach. The 5 criteria are:

C1 = Reliability
C2 = Responsive
C3 = Flexibility
C4 = Coast
C5 = Asset

4.1.2 Make a Pairwise Comparison Matrix

A comparison between one criterion and another will be assessed at this stage. The upper triangle matrix element is input. A comparison of one criterion and other criteria will also be evaluated. The results of the assessment can be seen in Figure 6.

KRITERIA	Reliability	Responsive	Flexibility	Cost	Asset
Reliability	1.00	3.00	5.00	7.00	9.00
Responsive		1.00	3.00	5.00	7.00
Flexibility			1.00	3.00	5.00
Cost				1.00	3.00
Asset					1.00

Figure 6: Pairwise comparison matrix table.

We use the formula to get the value of the lower triangular matrix element:

$$a[j,i] = \frac{1}{a[i,f]} unuki \neq j \quad (3)$$

The results add up the values of each column in the matrix. The results can be seen in Figure 7.

CRITERIA	Reliability	Responsive	Flexibility	Cost	Asset
Reliability	1.00	3.00	5.00	7.00	9.00
Responsive	0.33	1.00	3.00	5.00	7.00
Flexibility	0.20	0.33	1.00	3.00	5.00
Cost	0.14	0.20	0.33	1.00	3.00
Asset	0.11	0.14	0.20	0.33	1.00
Jumlah	1.79	4.68	9.53	16.33	25.00

Figure 7: Matrix tables of pairwise comparison values.

In column (C1 row C2) is the result of an intermediate calculation ((value in column C1 row C1 = 1) / (value in column C2 row C1 = 2)) gets a result of 0.33. While the total value is obtained from the sum of each column, for example the value of the number of columns C1 = 1.79 is obtained from the sum of column values C1 (1 + 0.33 + 0.20 + 0.14 + 0.11).

After getting the paired comparison matrix value, the next step is to divide the value of each element by the number of each column in table 6, namely (row value column = = value in table 6 column C1 row C1 = 1) / (sum of each column = 1.79) Then for the other values obtained from the same calculation, for more clearly the results can be seen in Figure 8 below.

CRITERIA	Reliability	Responsive	Flexibility	Cost	Asset	Jumlah	Prioritas
Reliability	0.56	0.64	0.52	0.43	0.36	2.51	0.50
Responsive	0.19	0.21	0.31	0.31	0.28	1.30	0.26
Flexibility	0.11	0.07	0.10	0.18	0.20	0.67	0.13
Cost	0.08	0.04	0.03	0.06	0.12	0.34	0.07
Asset	0.06	0.03	0.02	0.02	0.04	0.17	0.03

Figure 8: Table of the criteria value matrix.

The results of the sum column in Figure 8 are obtained from the sum of each row, for example: value = 2.51 is obtained from the sum (0.56 + 0.64 + 0.52 + 0.43 + 0.36), for the next row is obtained from the same calculation results.

As for the value in the priority column obtained from (the value of the number of columns) / (number

of criteria), which is five criteria. For example, for the priority value of line C1 = 0.50 obtained from (value of the number of rows C1 = 2.51) / (number of criteria = 5), the same steps are carried out in the previous rows.

4.1.3 Make an Addition Matrix for Each Line

To make the addition matrix for each row in this way, (value of priority in table 7) * (pairwise comparison matrix in table 6). For example, (C1 priority value in table 7 = 0.50) * (C1 row C1 in table 6 = 1) = 0.50. The other values are obtained in the same way; the results can be seen in Figure 9 viz.

CRITERIA	Reliability	Responsive	Flexibility	Cost	Asset	Jumlah
Reliability	0.50	0.78	0.67	0.47	0.31	2.74
Responsive	0.17	0.26	0.40	0.34	0.24	1.41
Flexibility	0.10	0.09	0.13	0.20	0.17	0.70
Cost	0.07	0.05	0.04	0.07	0.10	0.34
Asset	0.06	0.04	0.03	0.02	0.03	0.18

Figure 9: Table of the criteria value matrix.

After multiplying each element by the priority value, then add each row from the obtained matrix. For example for line elements C1 = 2.74 is the sum of (0.50 + 0.78 + 0.67 + 0.47 + 0.31), then the other rows are carried out with the same calculation process up to C5.

4.1.4 Calculate Consistency Ratio

The value calculation of the consistency ratio aims to see the value of the consistency ratio (CR). If the value of CR <= 0.1 then the calculation can be accepted or valuable. Whereas if the CR value is more significant than 0.1, then the pairwise comparison matrix must be corrected so that it is declared to be inappropriate. To calculate the value of the consistency ratio can be seen in Figure 10 below.

KRITERIA	Jumlah Per baris	Prioritas	Hasil
Reliability	2.74	0.50	5.46
Responsive	1.41	0.26	5.43
Flexibility	0.70	0.13	5.20
Cost	0.34	0.07	5.03
Asset	0.18	0.03	5.09
Jumlah			26.21

Figure 10: Consistency ratio table.

The value in the sum column of each row is obtained from the value of the sum column in table 8, while the priority column value is obtained from the priority column value in Figure 8. For the result, column values are obtained from the sum of the sum values for each row with priority. For example the value of 5.46 results from (column number in row C1 = 2.74) / (priority column in row C1 = 0.50) = 5.46 and so on until row C5. After obtaining the value of the results of each row, then the next is to add all the values in the results column so that the results obtained are 26.2.

After obtaining the total value of 26.21, the next step is to calculate the value of λmax. The value of λ max is obtained from the value of number = 26.21 / number of criteria = 5. In this study, the number of criteria is five criteria, so the λmax value is 5.26.

4.1.5 Calculate the Consistency Index

Calculating the consistency index (CI) using the following formula:

$$CI = \frac{\lambda maks - n}{n-1}$$

$$CI = \frac{5.26-5}{5-1}$$

$$CI = 0.26/4$$

$$CI = 0.06 \quad (4)$$

4.1.6 Calculate Consistency Ratio

The value of the consistency ratio (CR) is obtained using the formula below:

$$CR = CI/IR$$

$$CR = 0.06/1.12$$

$$CR = 0.05 \quad (5)$$

Where the value of 0.05 is obtained from the calculation of the consistency index in the previous stage, while the value of IR (Random Index) is taken from the rules of the random index predetermined according to the matrix size of the elements, where the IR value rules have been displayed in table 2 so that the results of CR are = 0.05, therefore CR ¡= 0.1, the consistency ratio from the calculation can be accepted.

The same steps are carried out in the calculation of sub-criteria and calculation of sub-criteria, the same calculation in the previous stage determines the priority of sub-criteria and priority of subcriteria using the AHP method. In order to obtain the values of each element in the sub-criteria and sub-criteria, as shown in Figure 11 below.

Criteria	Priority	Sub Criteria	Priority Sub Criteria	Sub-Criteria	Priority of Sub-Criteria
C1	0.49	Delivery of products on time	1.00	Faster = <1 day	1.00
				On Time = 0 days	0.41
				Not Within Target => 1 Day	0.17
		Product Amount	0.47	Exceeding Needs	1.00
				According to the needs	0.41
				Under Needs	0.17
		Smooth Delivery	0.22	Smoothly	1
				Not smooth	0.3
		Shipping Conformity	0.10	Corresponding	1
				It is not following	0.3
C2	0.26	Product Responding Speed	1.00	Hurry up	1
				Slow	0.3
		Ease of Responding to Products	0.41	Easy	1
				Not easy	0.3
		Substitution of Damaged Goods	0.17	Hurry up	1
				Slow	0.3
C3	0.13	Convenience in Contact	1.00	Easy	1
				Hard	0.3
		Anticipating Company Needs	0.41	Hurry up	1
				Slow	0.3
		Delivery time	0.17	Hurry Up	1
				Slow	0.3
C4	0.07	Price Match	1	Corresponding	1
				it is not following	0.3
		Discount	0.23	7%	1.00
				6%	0.41
				5%	0.17
C5	0.05	Payment Time	1.00	Credit	1
				Cash	0.3
		Inventory	0.47	Hurry Up	1
				Slow	0.3
		Quality of Goods	0.22	Have quality	1.00
				Less Quality	0.41
				No quality	0.17
		Endurance of Goods	0.10	Well	1.00
				Not good	0.41
				Bad	0.17

Figure 11: Consistency ratio table

4.2 Solving Results using the AHP Method

This display is a display of the results of local and national supplier assessments using the AHP method.

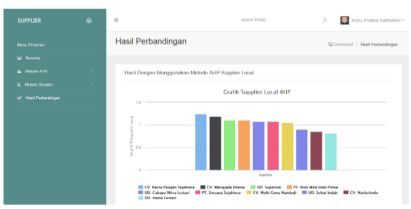

Figure 12: Comparison results page of local AHP method

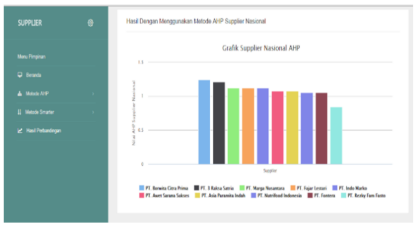

Figure 13: Comparison results page of the national AHP method

In this research, the problem that has been explained above is resolved by the application made, namely Measuring Supplier Performance, with the SCOR approach using the AHP method, which can be accessed through the website. How is the Application of the Analytical Hierarchy Process in Supplier Performance Assessment? In this study, it can be seen that the application of the AHP method in performance appraisal provides more structured and stored results in a database. The several displays that show information about the measurement results using the AHP method can be chosen in Figure 14.

Figure 14: Final result page of AHP calculation

5 CONCLUSIONS

The study explained that how to solve a problem with a measuring supplier performance that is less effective in measuring supplier performance to determine which suppliers can be maintained as partners in Karsa Utama Lestari Gorontalo Ltd. The supplier performance appraisal process still uses the conventional appraisal process without supporting data, and there is no decision support system in measuring supplier performance to determine which suppliers will be partners with Karsa Utama Lestari Ltd.

The supplier performance evaluation system is a system to assess the performance of suppliers who are at Karsa Utama Lestari Gorontalo Ltd. The method is used DSS, which is called the Analytical Hierarchy Process (AHP). The AHP method consists of five studies at criteria, 16 sub-criteria, and 37 sub-criteria.

We used five main criteria in the supply chain operation reference (SCOR) approach. They are reliability, responsiveness, flexibility, coast, and assets.

The DSS method used in the supplier performance evaluation process, the Analytical Hierarchy Process (AHP) method, is significantly better than the conventional assessment process.

The results showed that the evaluation of the final results using the method is the company can see which suppliers can be used as partners in the company.

The process of applying the AHP method begins by making a pairwise comparison matrix, making a sum matrix for each row, calculating the consistency ratio, calculating the consistency index, and calculating the consistency ratio. Furthermore, the values obtained in the priority criteria, priority sub-criteria, and priority sub -sub-criteria will be used in the process of evaluating the performance of local suppliers and national suppliers. In contrast, the previous method did not have a valuation model because it was still conventional.

The result of the calculation process carried out by the AHP method with the calculation of the assessment done manually will undoubtedly produce different values.

The applying of the AHP method used priority values on sub-criteria. The product delivery subcriteria on time and sub-criteria are faster, more timely, and not on target, as well as other subcriteria and subcriteria obtained by the AHP method. In contrast, the company does not use the assessment model as above. While the assessment process carried out between AHP methods has different values and results at local and national suppliers.

The AHP modeling, the weighting process, uses interests based on guidelines on the decision support system (DSS). The benefits entered in the triangle matrix are the results that have been agreed by the company, where reliability is more important than all the main criteria. So, the analytical hierarchy process method can help to determine company performance. The results are shown in the previous discussion, where the conventional assessment process is a subjective assessment. With the application of the AHP method of supplier performance appraisal in the company to get results following the quality of each company.

6 SUGGESTIONS

The result of the study is the development of a measuring supplier performance system. However, suppliers cannot see the results of the assessments given by the company. For this reason, this future study is expected to be developed to produce an information system, and suppliers can see the results of the assessment provided by the company. Suppliers can access the system, for example, getting their logins from the relevant agencies.

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