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Analytical Hierarchy Process as Decision Support System in SCOR Model

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Abstract*: PT. Meraki Digital Indonesia, or commonly called Meraki Group, is one of the multi-business companies that one of the businesses is a fashion trade. Management wants to know the performance of sales of rovue products needed by product managers to improve performance on sales of these rovue products. So we need an appropriate framework to measure the performance of this product. The variables used in this research refer to the SCOR model, namely Supply Chain external performance (customer-facing) and Supply Chain internal performance (Internal facing) and a combination with the AHP method is performed to determine which aspects require improvement by assessing the attributes of reliability, responsiveness, flexibility, cost, and asset management. From the results obtained by the performance of Meraki Group using the SCOR model is 62% or 62.61 points, and the benchmark analysis obtained four indicators that still have a gap, namely OFCT 5 days, USCF +71, and CTCCT 20 days.

Index Terms*: Analytical Hierarchy Process, Performance, SCOR Model, Supply Chain.

I. INTRODUCTION

In the current digitalization era, competition in the sale of goods on e-commerce is very high, E-commerce in Indonesia is proliferating along with the rapid growth of internet usage, e-commerce players are also growing following the trend of online shopping in the community [1].Internet businesses need to expand their business, and now the internet is a necessity that must be owned by business people in doing business for business expansion and to introduce their products, one of them is by using marketplace services and social media to make sales. In the business world, a website in the form of e-commerce is a necessity of a business to develop its business because it has various benefits [2].Through a website portal whose functions other than being accessible anywhere and can see products or hear about a product can arouse customer needs [3]. PT. Meraki Digital Indonesia, or commonly called Meraki stands, is one of the multi-business companies whose business is a fashion trade. Rovue is an item of homemade clothing. Current sales using social media such as Whatsapp, Instagram, and Tokopedia to promote this Rovue product. One strategy in sales by using marketplace services at Meraki Digital Indonesia, directors believe that using Meraki Digital Indonesia's social media services will increase their sales. Due to the existence of a market through social media that has a large number of visitors based on sales data per month in 2018 seen in figure 1 and table 1.

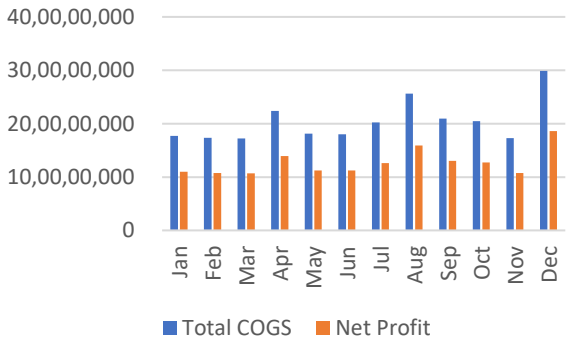

Fig 1. Sales Data per Month 2018

From Figure 1 describes the growth rate of rovue products for 1 year and in detail in table 1 the sales quantity obtained for 1 year was 5270 units of clothing with a total COGS of Rp 389,980,000 and a total price of Rp 632,400,000. This for one year has a net profit of Rp. 242,420,000. From this data, management wants to know about the performance of the sales of rovue products needed by the product manager to improve the performance of the sales of these products. So that a decision support system is needed and an appropriate framework for measuring the performance of this product. decision support system [4] is defined as "interactive, flexible, and adaptable computer-based information systems, specially developed for supporting the solution of a non-structured management problem for improved decision-making, [5] indicating that DSS is often used in support of sequential dependent decision making but not as often as pooled interdependent decision-making Pooled. Whereas [6] explain It utilizes data, it provides easy user interface, and it allows for the decision maker own insights. Sales is an integrated activity to develop strategic plans that are directed at efforts to satisfy the needs and desires of buyers or consumers, in order to get sales that generate profits or profits [7] so that from this problem the objective in this research to measuring the performance of product supply chain activities Rovue using the Analytical Hierarchy Process (AHP) [8].

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The AHP [9] is a decision-making method that was developed by Saaty and this technique calculates the qualified priorities of a given set of alternatives on a scale based on the judgment of the decision-maker.

AHP may help to make a better decision [10].Whereas, supply Chain Operations Reference (SCOR) The model explains the mapping carried out to get a clear picture of the model of material flow, information flow, and financial flow of a company's supply chain. Reciprocal relationship between providers and customers to deliver very optimal values to customers at a relatively low cost but provide overall supply chain benefits [11][12].

II. LITERATURE RESEARCH

A. Supply Chain Management

Supply chain management is a reciprocal relationship between the provider and the customer to convey very optimal values to the customer at a fairly low cost but provides a comprehensive supply chain advantage [13]. Another theory, Supply Chain Management, is the integration of material and service procurement activities, conversion into semi-finished goods and final products, and delivery to customers. All of these activities include purchasing and outsourcing activities, plus other important functions for the relationship between suppliers and distributors [14]. According to Kotler [15] suggests that the distribution channel is a series of organizations that are interdependent and involved in the process to make an item or service ready to be used or consumed. Distribution channels are basically intermediaries that bridge between producers and consumers.

B. Decision Support System

Decision Support System is almost the same as traditional management information systems because both depend on the database as a data source, SPK emphasizes the decision-making support functions throughout all stages, as a companion to actual decisions that are still made by executive authority as decision making [16]. As well as from the explanation, the characteristics of a decision support system are [17]: (1) offering flexibility, ease of adaptation and fast response. (2) allows the user to start and control input and output. (3) can be operated with little or no help from professional programmers. (5)pProvide support for decisions and problems whose solutions cannot be determined in advance. (6) using sophisticated data analysis and modeling tools.

C. Analytical Hierarchy Process

Analytical Hierarchy Process is a framework for making effective decisions about complex problems by simplifying and accelerating the decision making process by solving the problem into its parts, arranging parts or variables in a hierarchical arrangement, giving numerical values to subjective considerations about the importance of each variable and synthesize these various considerations to determine which variables have the highest priority and act to influence the outcome of the situation. AHP is used to scale down the ratio of several discrete and continuous paired comparisons. Pairwise comparisons can be obtained through actual measurements or relative measurements of degrees of preference, or interests or feelings. Thus, this method is very useful to help get the ratio scale of things that were initially difficult to measure such as opinions, feelings, behaviors and beliefs. The use of AHP begins by making a hierarchical or network structure of the problems that you want to examine. In the hierarchy there are main objectives, criteria for criteria, sub criteria, sub criteria and alternatives to be discussed [9].

III. METHOD

A. Data Collection

Data collection techniques are collection techniques that are carried out by giving a set of questions or written statements to the respondent to answer [18]. Data collection methods commonly used in a research are interviews, questionnaires, and observations [19]. As well as in this research, researchers used primary data, namely data collection with surveys and secondary data. In this research, the authors conducted data collection using the following techniques:

1. Library Studies: In this research the author seeks to obtain some information from knowledge that can be used as a guide in research, namely by researching the literature to research, examine, research, and examine literature in the form of books, journals, bulletins, symposium results related to research to obtain material -materials that will be used as the theoretical basis.
2. Questionnaire: The questionnaire is a technique of data collection carried out by giving a set of questions or written statements to the respondent to answer [18]. The questionnaire is an efficient data collection technique if the researcher knows for sure the variables to be measured and knows what can be expected from the respondent. The type of question that the author uses is closed questions, namely the questionnaire the answer has provided. Closed questions will help respondents to answer quickly, and also make it easier for researchers to analyze data on all questionnaires that have been collected
3. Interview: The researcher interviewed only three people to become experts namely division managers because employees who have the aim to improve the performance of chaotic rovue supply at Meraki Digital Indonesia.

B. Data Analysis Technique

Data analysis techniques in this research, the processing of data carried both primary and secondary data that has collected, descriptive data separated from the data in the form of numbers, or qualitative data sorted from quantitative data and then ready to be analyzed. The analysis technique used in this research is as follows: (1) calculation of SCOR model first level metric performance attributes. (2) normalization result from secondary data from first level metric. (3) First level metric weighting in secondary data. (4) analysis using Analytical Hierarchy Process. (5) Calculating the total SCOR. (6) benchmark. (7) recommendation for Improvement

C. Research Variable

Variables are anything in the form of what is determined by researchers to studied in order to obtain information about it; then, conclusions are drawn [18].

While the variables in a research are attributes of a group of objects under research, have variations between one another in the group, for example, height and weight, which are attributes of a person, in this case, the object of research [20]. The variables used in this research refer to the SCOR [11] model: (1) supply chain external performance (customer-facing). (2) supply chain internal performance (Internal-facing).

IV. RESULT AND DISCUSSION

A. Supply Chain Process

Meraki Group describes its business processes as a series of business processes, or activities of organizational functions that transform from inputs to outputs, which are from raw materials to goods that are ready to sell or products, in this case, the products used as objects are rovue.

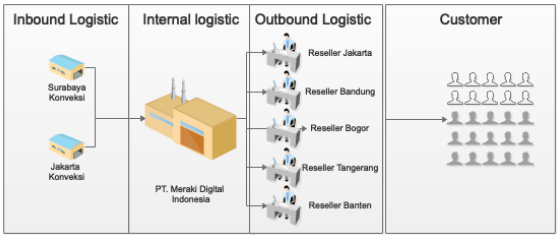

Fig 2. Supply Chain Process Meraki Group

Figure 2 explains the inbound, internal, outbound, and customer processes. Meraki Group has permanent convection located in Surabaya and Jakarta, according to the demand for raw materials to be produced by Meraki Group to be processed and made into clothing products with the rovue brand. Furthermore, the production process will be carried out in stock and sold to resellers in Jabodetabek, Banten, and Bandung. Rovue products sold will be sold directly or indirectly to customers spread throughout Indonesia.

B. SCOR Assessment for Primary Data Performance Assessment

Based on business processes at this stage, assisted by experts for approval in conducting performance appraisal by brainstorming experts to answer the criteria tested.

Table 1. Service Operation Area Questionnaire Result

No.	Performance Notation	Result	Measurement	Normalization Result (%)	Weighted Normalization
1	POF	99.27	%	99.27	0.215
2	OFCT	12.39	days	47.65	0.103
3	USCF	9	days	55.5	0.120
4	USCA	82	%	82	0.177
5	DSCA	N/A	%	N/A	0.000
6	SCMC	19	%	19	0.041
7	COGS	42.67	%	42.67	0.092
8	CTCCT	150	days	30.45	0.066
9	RSCFA	53.61	%	53.61	0.116
10	ROWC	32.28	%	32.28	0.070
TOTAL NORMALISATION SCALE				462.43	1.00

Table 1 explains the calculations on normalization, and the weights on the criteria tested, the total normalization of 462.43%.

C. Assessment of Secondary Data Performance with the Analytical Hierarchy Process

Furthermore, for performance evaluation using secondary data, it is intended as actual field data whose results are expected to provide a description of supply chain performance at the strategic level, so that the combination with the AHP method is carried out to determine which aspects require improvement by assessing the attributes of reliability, responsiveness, flexibility, cost, and asset management. The purpose of this assessment is to determine the desire or desire of the experts to improve the performance of this supply chain.

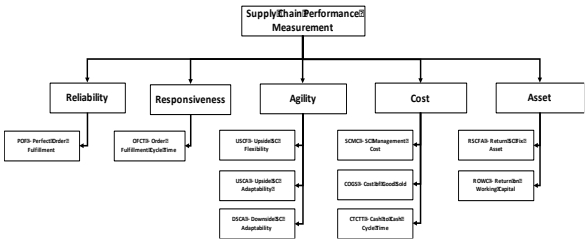

Fig 3. Arrangement of AHP criteria and sub-criteria criteria for SCOR measurement

Based on the Downside Supply Chain Adaptability, primary data measurement results are processed from a pairwise comparison matrix using AHP, then created a performance hierarchy using AHP.

Table 2. Conclusion Ranking Criteria

Summary	Final Score	Ranking
Reliability	0.35	1
Responsiveness	0.268	2
Agility	0.194	3
Cost	0.12	4
Asset	0.067	5

Table 2 explains ranks 1 to 5 that have obtained, based on the results of processing using AHP; it found attributes that need to be improved based on the wishes of experts starting from the lowest, namely assets, costs, and agility.

D. Performance Assessment Results

Furthermore, to determine the performance of the entire supply chain, the actual calculation results derived from secondary data calculations can be seen in Table 3.

Table 3. Performance Assessment Results Meraki Group

Performance Notation	Result	Measurement	Normalization Result (%)	Weighted Normalization	Performance Score	Total Score
POF	99.27	%	99.27	0.215	21.31	62.61 ~ 62%
OFCT	12.39	days	47.65	0.103	4.91	
USCF	9	days	55.5	0.120	6.66	
USCA	82	%	82	0.177	14.54	
DSCA	N/A	%	N/A	0.000	0	
SCMC	19	%	19	0.041	0.78	
COGS	42.67	%	42.67	0.092	3.94	
CTCCT	150	days	30.45	0.066	2.01	
RSCFA	53.61	%	53.61	0.116	6.22	
ROWC	32.28	%	32.28	0.070	2.25	

Table 3 explains the results of the overall performance evaluation criteria, the performance of PT. Meraki Digital Indonesia valued at 62.61 or 62%. The results of this performance are classified as average (average), leading to less.

E. Benchmark

The results obtained can help companies to find out the company's position in similar industries and provide an overview of the extent of the performance of operating activities, as well as the results of performance evaluations that have been processed based on SCOR criteria, namely Parity, Advantage, and Superior in the table 4.

Table 4. Performance Assessment Results Meraki Group

Performance Attribute	KPI Metric	Actual Score	Strategy	Benchmark			GAP
				P	A	S	
Reliability	Perfect Order Fulfillment (POF)	99.27 (%)	Superior	92	96	98	1,27
Responsiveness	Order Fulfillment Cycle Time (OFCT)	12,39 (Days)	Parity	8	6	4	5 Days
Agility	Upside Supply Chain Flexibility (USCF)	9 (Days)	Parity	80	62	40	71
Cost	Cost of Goods Sold (COGS)	42,67 (%)	Superior	>=50	43-49	<43	0,33
Asset	Cash to Cash Cycle Time (CTCCT)	150 (Days)	Parity	130	110	90	20 Days

F. Recommendation for Improvement

The SCOR mapping model displays the scope and scope of the supply chain. The scope is based on 5 core processes namely Plan, Source, Make, Delivery and Return, and it sets out the performance targets to be achieved by the company from suppliers to end users.

V. CONCLUSION

From the research, which includes of assessments and calculations to improve incident ticket services, conclusions can be described as follows:

1. The use of the ITIL framework in the company is one of them applied in conducting assessments, which is the initial stage of managing IT services at the company. Through this assessment, users can find out how far their company has implemented the ITIL framework on their existing systems in managing IT services. After knowing its position, companies can quickly implement ITIL in their IT service management, which is known to need improvement in their management still.
2. The results of the overall measurement of the supply chain performance of Meraki Group are 62%, or 62.61 points, which still classified as the average category (average) leads to lack. Supply chain performance at PT. Meraki Digital Indonesia from the customer-facing variable has a higher value than the internal-facing; it can be considered PT. Meraki Digital Indonesia focuses on customer satisfaction but still must improve performance indicators that focus on internal facing. Benchmark analysis results obtained four indicators that still have a gap, namely 5-day OFCT, USCF + 71, 20-day CTCCT.

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