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PERFORMANCE ANALYSIS OF GREEN SUPPLY CHAIN MANAGEMENT OF DIAPER RAW MATERIALS

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Abstract: PT. X is a company engaged in manufacturing and it is necessary to do a performance measurement in improving supply chain management to be an environmentally friendly Green Supply Chain management. The purpose of this study is to determine the current condition of the company's SCM and then analyze the value of the performance of green supply chain management and propose improvements to the company after knowing the most influential indicators in order to improve the performance of green supply management in the company. Based on the problems studied, the method used in the study is to measure the performance of the company's supply chain using the Supply Chain Operation References (SCOR) method. The initial hierarchy model of performance measurement is adjusted to the condition of the company to measure the performance of its supply chain, while the normalization of Snorm De Boer serves to equalize the matrix value used as an indicator of measurement. The importance of performance attributes is measured based on weighting with subjective questionnaires using AHP. SCM Conditions of PT. X it is known that there are two stages of SCM that have low KPI values, namely manufacturing and distribution. Green supply chain performance measurement results obtained that the calculated performance value is 67.95. This value indicates that the achievement of the performance of the green supply chain management is classified as average and needs to be improved, especially for indicators that have low values

Keywords: Supply Chain Performance, GSCM, SCOR, AHP.

INTRODUCTION

The current environmental problem is one of the discussions among industry players, this is evidenced by the level of public awareness of environmentally friendly products. With the level of public awareness of products that are environmentally friendly then encourage

industry players to apply the concept of environmental care into their businesses. Then in other studies it has been stated that, components, processes and information power flows are needed to build a supply chain management system simultaneously, hence there are government arrangements to raise awareness in terms of protecting the environment. Therefore, companies today cannot ignore environmental issues if they want to survive in the global market.

Supply chain management (SCM) is a method or approach to managing the flow of products, information and money in an integrated manner involving parties, starting from upstream to downstream consisting of suppliers, factories, agents of distribution activities and logistics services (Pujawan, 2017).

The implementation of supply chain management is not necessarily a positive impact, there are negative factors that arise due to the problem of waste. So, in addition to implementing supply chain management, a company must implement green supply chain management so that the waste generated from the production process can be managed properly. The industrial sector as the main actor in environmental problems should realize the importance of using environmentally friendly technology in carrying out its production processes to minimize waste and reduce negative impacts on the surrounding environment..

Green SCM integrates environmental and supply chain management and enhances the role of the environment in the creation of supply chain value. Green SCM recognizes and measures the environmental impact of supply chain processes in an organization (Paul, 2014). GSCM aims to eliminate or minimize waste (energy, gas emissions, hazardous chemicals, waste) along the supply chain network. GSCM can also be defined as green procurement, green manufacturing, green distribution, and reverse logistics (Ninlawan et al. In Djunaidi et al., 2018). That is why there is a need to audit the supply chain based on environmental sustainability.

PT. X is one of the leading fast moving consumer goods (FMCG) companies in Indonesia and has been established since 1997 which has received ISO 14001 certification, which is an environmental management system. The production process is strongly influenced by the availability of raw materials. Supply chain process flow at PT. X is illustrated in the following chart.

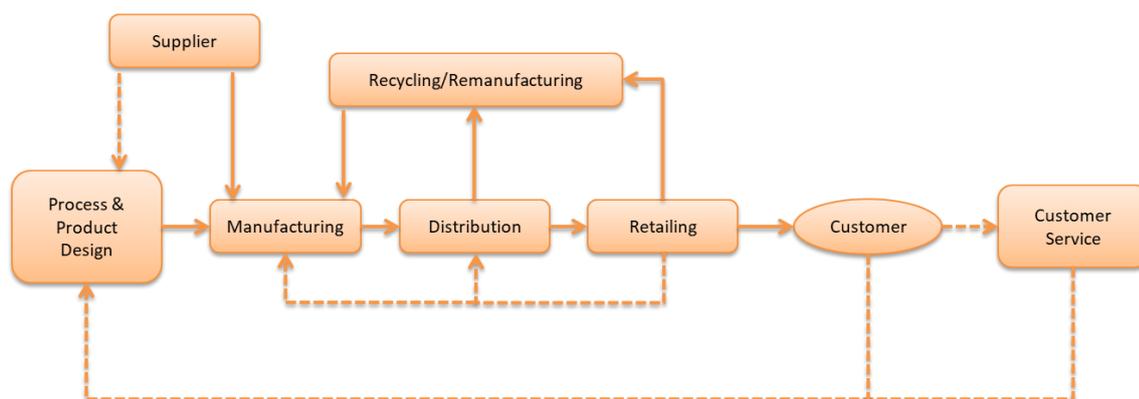


Figure 1. Supply Chain Flow

Source: PT. X. (2018)

Suppliers, manufacturing, distribution, retailing, and recycling / remanufacturing connected by arrows describe the flow of material with stock inventory between each stage. Delivery information in the opposite direction is displayed as a dotted line and includes the activities carried out by the supplier, the product design process, and customer service. The stage of manufacturing represents the traditional operation in which raw materials arrive from external suppliers, raw materials change in several ways to add value, creating inventory of finished goods. Other downstream stages such as distribution and retail also add a value to raw materials.

For this reason, it is necessary to measure performance in improving supply chain management at PT. X has become an environmentally friendly Green Supply Chain management so the company knows objectively how supply chain management has been performing so far. According to (Paul, 2014), an effective performance measurement will be able to reveal what adjustments are needed in the company's supply chain flow. Performance measurement in the supply chain involves internal processes and also the expected performance of other supply chain member companies. Green supply chain management performance measurement and measurement model design can be done using the SCOR (Supply Chain Operations Reference) model. Meanwhile, to determine its weight using the AHP (Analytical Hierarchy Process) method.

LITERATURE REVIEW

Supply Chain Management

The term supply chain management was first coined by Oliver and Weber in 1982. The concept of supply chain management is the integration of a process in which several organizations work together to obtain raw material, turning raw material into a finished product that will be ready for delivery to retail or directly to the customer. Or in short supply chain management is a system where a combined organization distributes its production goods or services to its customers (Darajat and Yunitasari, 2017).

Then SCM is management along supply chain activities from upstream to downstream for product and service results. At the highest level, the integrated process of supply chain management can be divided into two, namely the production and inventory control process and the distribution and logistics process (Azari et al., 2018).

A supply chain network has three streams that must be managed properly, namely material flow, information flow, and also money flow. The three streams are defined as supply chain management. If the three streams can be well managed and integrated with one another (Pujawan, 2017), as illustrated in Figure 2, efficiency and effectiveness in the SCM process will be achieved.

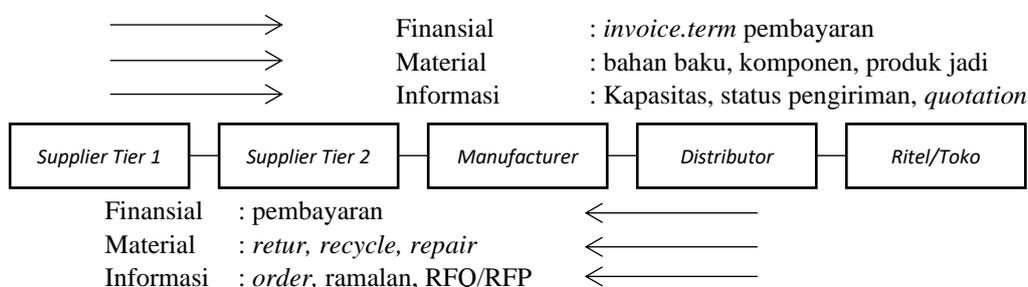


Figure 2. Three Networks that must be managed properly in SCM

Source: Pujawan, 2017

From Figure 2. three flows of goods that are well managed in SCM can be described as follows:

1. The flow of goods that flows from upstream (upstream) to downstream (downstream). An example is raw material sent from a material supplier to a semi-finished material factory. After the products are finished producing, they are sent to the distributor and then used by the customer
2. The flow of money and the like, which flows from downstream to upstream
3. Information flow, which occurs from upstream to downstream and vice versa. For example, inventory information available at the distributor is needed by the factory to determine the level of production and demand for the next period. Vice versa, information about supplier capacity is needed by the factory to determine the number of orders that will be given to suppliers and alternatives for selecting similar suppliers

Green Supply Chain Management (GSCM)

The GSCM concept is the integration of environmental perspectives into supply chain management including product design, selection and selection of raw material sources, manufacturing processes, delivery of final products to consumers, and management of products after their expiration (Toke et al. In Rohdayatin et al., 2018). So it can be concluded that the concept of environmental care is based on an environmental perspective, namely how to reduce waste and environmental impacts caused by supply chain activities. This is an important long-term non-financial aspect related to the environment that the company must consider in maintaining good relations for the sake of the sustainability of its supply chain activities in the future.

Information flow, which occurs from upstream to downstream and vice versa. For example, inventory information available at the distributor is needed by the factory to determine the level of production and demand for the next period. Vice versa, information about supplier capacity is needed by the factory to determine the number of orders that will be given to suppliers and alternatives for selecting similar suppliers.

Integrating environmental thinking into supply chain management is a GSCM concept. This concept increases the balance between marketing performance and environmental issues that are not only oriented towards long-term survival but also have an impact on long-term profitability, where the company's image and competitive advantage in the future will be increased (Azari et al., 2018).

Green Supply Chain best practices are integrated into business results (Paul, 2014), namely:

- a. Align the goals of green supply chain management with business objectives. Aligning the improvement of the Green SCM with the company's business goals will create strategic value. The alignment involves the following activities:
 - Determination of the role of the environment in the business of product / service differentiation, competitor management, risk management cost reduction, market redefinition.
 - Determination of the role of the environment in the business of product / service differentiation, competitor management, risk management cost reduction, market redefinition.
- b. Supply chain evaluation as a single cycle system
- c. Use green supply chain analysis as a catalyst for (accelerating) innovation
- d. Focus on reducing resources to reduce waste
- e. Supply chain integration with suppliers and customers
- f. Green supply chain maturity model

The water environment

There is a link between the population (human) and the decline in the quality of the environment. Decrease in the quality of the environment by humans consists of 3 factors, namely the

number of people, the amount of natural resources used by each human being, and the environmental impact of natural resources used (Miller in Puspita, 2016).

The river as one of the components of the environment has an important function for human life, but most of the rivers in urban areas have experienced pollution as a result of development that is not environmentally sound, this condition has a direct and indirect impact on the organisms that live in it and the people who use it (Yudo in Fisesa, 2014).

Supply Chain Operation Reference (SCOR)

Supply Chain Operations References (SCOR) is a reference process model that was approved by the Supply Chain Council (SCC) formed in 1996 (Paul, 2014). SCOR was created by SCC in order to provide a method of self-assessment and comparison of supply chain activities and performance as a cross-industry supply chain management standard. This model presents a business process framework, performance indicators, best practices and unique technology to support communication and collaboration between supply chain partners, so as to improve the effectiveness of supply chain management and the effectiveness of improving supply chains. On the SCC website even though it is very simple, the SCOR model has proven resilient and is established as a powerful tool set to describe, analyze, and improve supply chains.

SCOR is a framework for describing business activities between supply chain components from suppliers to customers. This concept integrates three main elements in management, namely business process reengineering, benchmarking, and process measurement into the function framework in the supply chain.

SCOR is a business process in supply chain activities designed by the Supply Chain Council. SCOR aims to facilitate company communication and interaction between parties from suppliers to end customers. It is also useful to develop new supply chain practices and improve existing supply chain activities (Azari et al., 2018).

SCOR is a reference model of supply chain operations. As is the framework required in the previous section. SCOR is basically also a process based model. This model integrates three main elements in management, namely business process reengineering, benchmarking, and process measurement into a cross-functional framework in the supply chain (Pujawan, 2017).

Normalisasi Snorm De Boer

Each indicator has different weights with different parameters, so the process of matching parameters by normalization is needed. The normalization process is carried out with the Snorm de Boer normalization formula. Normalization plays an important role in achieving the final value of performance measurement. Following is the equation about Snorm de Boer normalization (Trienekens, J. H & Hvolby, H.H, 2000), namely:

$$\text{For Larger is Better} \quad S_{norm} (skor) = \frac{(SI - S_{min})}{S_{max} - S_{min}} \times 100$$

$$\text{For Lower is Better} \quad S_{norm} (skor) = \frac{(S_{max} - SI)}{S_{max} - S_{min}} \times 100$$

Information:

SI : The actual indicator value that was successfully achieved

S max : The value of achieving the best performance of performance indicators

S min : The value of the worst performance achievement of performance indicators

Each indicator weight is converted into an interval of a certain value of 0 to 100. A value of 0 is interpreted to be the worst while a value of 100 is said to be the best. So that the parameters of each indicator are the same, the following shows the monitoring system of performance indicators.

Table 1. Monitoring System Performance Indicators

Sistem Monitoring	Indicator Performance
< 40	<i>Poor</i>
40 - 50	<i>Marginal</i>
50 - 70	<i>Average</i>
70 - 90	<i>Good</i>
> 90	<i>Excellent</i>

Analytical Hierarchy Process (AHP)

AHP is one of the decision-making theories developed by Thomas L. Saaty, he is a mathematician who worked at the University of Pittsburg in the United States in the early 1970s. AHP is a technique in organizing and analyzing complex problems, especially those related to the decision making process. This methodology is based on mathematical analysis and some psychological techniques to measure and compare variables with the addition of views with geometric averages to synthesize solutions (Saaty in Jenab, 2014).

In AHP the decision is taken by comparing in pairs the alternatives to be selected using a questionnaire. AHP handles various perspectives (criteria) and actions (sub criteria) with different degrees of importance and translates the overall results into an integrated matrix. The results obtained are enabling managers to know various perspectives from performance appraisal and understand the possibility of failure (Puryono et al., 2016).

Comparisons made in the AHP can be a reflection of a person's preferences and feelings towards a particular object so that the results of the AHP are an idea based on experience, knowledge and also imagination, this causes the AHP must have a degree of consistency to be declared valid (Ilhamizar, 2018).

RESEARCH METHODS

Based on the problems studied, the method used in this study is descriptive analysis using SCOR with data collection through observation and questionnaires with stakeholders who have expertise in their respective fields at the study site.

Data collected in this study include:

a. Primary data

Primary data is data taken directly from the research object. The following are primary data conducted by researchers:

1. The questionnaire is a list of pre-formulated written questions that the respondent will answer, usually in clearly defined alternatives (Sekaran, 2006). The form of the questionnaire used in this study refers to the sample questionnaire in (Saaty, 2007). The process of distributing the questionnaire was carried out at the study site which was distributed to 8 respondents who were considered to have capabilities as well as relations to the SCM performance assessment
2. Direct observation, the method of collecting data through direct observation or careful observation in the field or research location. It aims to be able to get a clear picture of the problem and maybe a clue to solving it.

b. Secondary Data

Secondary data is data and information that consists of data collected by means of:

1. Documentation Study

Collecting data obtained or sourced from documents originating from the SCM division of PT. X. The data needed is:

- Company profile data
- Raw material usage data
- Raw material demand data
- Raw material inventory data
- Data delivery of products to customers
- Monthly production data

2. Literature Study

Collecting data obtained from experts and other parties by studying books, articles and others.

Population is a generalization area consisting of objects / subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions (Sugiyono, 2006). The population in this study are people who are involved in supply chain activities in PT. X namely the 41 Department of Procurement, Production and Logistics. The sampling technique is done by stratified random sampling that is sampling by taking into account a level (strata) in the population element.

Respondents involved must have sufficient knowledge and experience about the problem. Therefore, respondents in this study consisted of 8 people, taking a sample size from each stratum.

Data analysis methods carried out To improve the performance of the green supply chain, the first thing to do is calculate the value of each existing business process. This value calculation is done through several stages of data processing. The data used in processing is the company's historical data.

1. Data analysis methods carried out To improve the performance of the green supply chain, the first thing to do is calculate the value of each existing business process. This value calculation is done through several stages of data processing. The data used in processing is the company's historical data.
2. The design of performance measurement is based on the SCOR model by identifying the level 1 matrix which is in the form of the SCM process that is in the SCOR. These processes include plan (planning process), source (the process of procuring raw materials), make (production process), deliver (delivery process), and return (return process). Metric at level 2 is the dimension for measuring SCM performance. Dimensions used include Reliability, Responsiveness, and Flexibility. At level 3 identify indicators that influence each process and the SCM dimensions of the company. From these three levels, a hierarchy of SCM performance indicator selection is made in the company based on filling in the indicator questionnaire to related parties and company data in the indicator. Information on each level can be shown in table 2.

Table 2. Operationalization of Variables

Variabel	Indikator	KPI No.	Key Performance Indicator
<i>Plan</i>	<i>Reliability</i>	PR-1	Meeting with customers
		PR-2	Providing education about environmentally friendly Use of raw materials
	<i>Responsiveness</i>	Pre-1	Period of production scheduling
		Pre-2	The time period identifies new product specifications
<i>Source</i>	<i>Reliability</i>	SR-1	Fulfillment of raw materials
		SR-2	Reliability in shipping raw materials Environmentally friendly raw materials Material return
	<i>Responsiveness</i>	SRe	On time delivery from suppliers
	<i>Flexibility</i>	SF	Supplier availability
			Have an ISO 14001 certified supplier
<i>Make</i>	<i>Reliability</i>	MR	Error in packing <i>Yield</i> <i>Loss</i> production
		<i>Responsiveness</i>	Mre
	<i>Flexibility</i>	MF	Flexibility in making products
	<i>Deliver</i>	<i>Reliability</i>	
<i>Responsiveness</i>			DRe
<i>Return</i>	<i>Reliability</i>		Internal Claim Customer Claim
		<i>Responsiveness</i>	RRe

3. Verification of Key Performance Indicators (KPI)

This verification is carried out to find out whether the SCM performance indicators that are designed are correct and in accordance with company needs, namely by checking which indicators have not been included or do not need to be included because of the possibility of similarities with other indicators.

4. Calculate the normalized value (score) for each metric using the Snorm De Boer normalization process

The value scale equation used is Snorm De Boer normalization process. In this study the value scale equation is done by interpolation or normalization models. The weights of the indicators are converted into certain value conversions between 0 and 100.

5. Weighting with Analytical Hierarchy Process (AHP)

The stages of weighting the KPI by using the Analytical Hierarchy Process (AHP). This weighting is done to determine the level of importance of each level and KPI.

6. Calculate the total value of SCM performance

The total value of SCM performance can be calculated by multiplying the normalization score value for each metric with the weight value of the metrics obtained from the weighting results using AHP.

7. The calculation results get the final performance value of green supply chain management to determine the parameters in the performance indicator monitoring system.

FINDINGS AND DISCUSSION

Research Respondents

The questionnaire was conducted involving experts with analytical hierarchy process (AHP) methods who have experience and insight in the field of supply chain management and have positions in managerial and strategic levels, so that they are selected as expert respondents.

The questionnaire given contained 13 questions consisting of 4 questions representing the process plan attribute, 4 questions representing the source process, 3 questions representing the make process, 1 question representing the delivery process and 1 question representing the return process

AHP processing

Variable Weighting

Pairwise comparisons are made by assessing the level of importance between one interest and another. Pairwise comparisons in this study were carried out by assessing the level of importance between variables and between indicators. The AHP questionnaire was filled out by experts from PT. X.

Table 3. Pairwise Comparison Matrix

Variabel	<i>Plan</i>	<i>Source</i>	<i>Make</i>	<i>Deliver</i>	<i>Return</i>
<i>Plan</i>	1	0.43	1.45	2.89	0.94
<i>Source</i>	2.31	1	1.00	3.72	3.33
<i>Make</i>	0.69	1.00	1	1.41	3.82
<i>Deliver</i>	0.35	0.27	0.71	1	2.14
<i>Return</i>	0.94	0.30	0.26	0.47	1
Total	5.3	3.0	4.4	9.5	11.2

Table 4. Normalization of Variable Matrices

Variabel	<i>Plan</i>	<i>Source</i>	<i>Make</i>	<i>Deliver</i>	<i>Return</i>	Number of Rows	Normalization
<i>Plan</i>	0.19	0.14	0.33	0.30	0.08	1.05	0.21
<i>Source</i>	0.44	0.33	0.23	0.39	0.30	1.68	0.34
<i>Make</i>	0.13	0.33	0.23	0.15	0.34	1.18	0.24
<i>Deliver</i>	0.07	0.09	0.16	0.11	0.19	0.61	0.12
<i>Return</i>	0.18	0.10	0.06	0.05	0.09	0.48	0.10
Total	1.00	1.00	1.00	1.00	1.00	5.00	1.00

Table 5. Variable Consistency Test Results

λ Maks	Consistency Index (CI)	Random Index (RI)	Consistency Ratio (CR)
5.38	0.10	1.12	0.09

CR <0.1 ==> Consistent

Based on calculations performed on the overall plan, source, make, deliver and return variables, it is known that λ max is 5.38 with a Random Index (IR) value of 1.12. By using the

formula $CI = (\lambda_{max} - n) / (n-1)$, the Consistency Index (CI) of 0.10 and $CR = CI / RI$ results in a CR of 0.09, where the value of $CR \leq 0.1$ indicates that the data used has been consistent and can be justified to do the calculation

Indicator Weighting

For the weighting of indicators, the data used comes from questionnaires entered into a pairwise comparison matrix. Similar to the step in weighting at the variable level, after calculating the pairwise comparison matrix proceed with normalization and consistency calculation. The following is the result of normalization calculation and consistency calculation

SCOR Calculation Results Normaisasi Snorm de Boer

Table 6. Normalization of Snorm de Boer and Calculation of Green SCOR Performance Metrics

Variable	Value (level 1)	Indicator	Value (level 2)	KPI No.	Key Performance Indicator	SNORM (Score)	Value (level 3)
Plan	0.21	Reliability	0.74	PR-1	Meeting with customers	62.50	0.33
				PR-2	Providing education about environmentally friendly	62.50	0.33
					Use of raw materials	64.28	0.34
		Responsiveness	0.26	Pre-1	Period of production scheduling	68.75	0.61
				Pre-2	The time period identifies new product specifications	43.75	0.39
Source	0.34	Reliability	0.22	SR-1	Fulfillment of raw materials	81.25	0.33
				SR-2	Reliability in shipping raw materials	75.00	0.31
					Environmentally friendly raw materials	0.00	0.00
					Material return	87.01	0.36
		Responsiveness	0.54	SRe	On time delivery from suppliers	62.50	1.00
		Flexibility	0.24	SF	Supplier availability	87.50	0.47
					Have an ISO 14001 certified supplier	100.00	0.53
		Make	0.24	Reliability	0.22	MR	Error in packing
	Yield					56.53	0.28
	Production loss					61.09	0.31
Responsiveness	0.54			Mre	The responsiveness of producing varied consumer orders	75.00	0.59
					Production Efficiency	51.29	0.41
Flexibility	0.24			MF	Flexibility in making products	87.50	1.00
Deliver	0.12	Reliability	0.59		Product Shortage	29.44	0.30
					Service Level	69.27	0.70
		Responsiveness	0.41	DRe	Lead Time of finished products	75.00	1.00
Return	0.10	Reliability	0.27		Internal Claim	36.64	0.57
					Customer Claim	27.91	0.43
		Responsiveness	0.73	RRe	Time to replace damaged product	62.50	1.00

SCM Performance Calculation

Calculation of the SCM final score is done by multiplying each normalization score that has been obtained from the Snorm De Boer normalization formula with the weight of each scope of the key performance indicators, dimensions, and processes.

1. KPI calculation

This calculation aims to find the final value of the existing KPI in the process and dimensions. The score obtained from the calculation with the formula 3.2 and the weight obtained from the calculation with AHP. This calculation can be seen in table 8.

2. Dimension calculation

This calculation aims to find the final value of the dimensions that exist in the process. The score is obtained from the calculation of the total KPI score in each dimension and the weight is obtained from the calculation by AHP. This calculation can be seen in table 9.

3. Calculation of SCM performance

This calculation aims to find the final value of SCM performance. The score is obtained from the calculation of the total dimension score in each process and the weight is obtained from the calculation with AHP. This calculation can be seen in table 10.

Table 7. Final Value of KPIs

Variable	Value (level 1)	Indicator	Value (level 2)	KPI No.	Key Performance Indicator	SNO RM (Score)	Value (level 13)	Final Score (Score x Value)	Total each Dimension	
Plan	0.21	Reliability	0.74	PR-1	Meeting with customers	62.50	0.33	20.64	63.10	
				PR-2	Providing education about environmentally friendly	62.50	0.33	20.64		
					Use of raw materials	64.28	0.34	21.83		
		Responsiveness	0.26	Pre-1	Pre-2	Period of production scheduling	68.75	0.61	42.01	59.03
						The time period identifies new product specifications	43.75	0.39	17.01	
Source	0.34	Reliability	0.22	SR-1	Fulfillment of raw materials	81.25	0.33	27.14	81.38	
				SR-2	Reliability in shipping raw materials	75.00	0.31	23.12		
					Environmentally friendly raw materials	0.00	0.00	0.00		
		Responsiveness	0.54	SRe	SF	Material return	87.01	0.36	31.12	62.50
						On time delivery from suppliers	62.50	1.00	62.50	
						Supplier availability	87.50	0.47	40.83	
Make	0.24	Reliability	0.22	MR	Have an ISO 14001 certified supplier	100.00	0.53	53.33	94.17	
					Error in packing	81.25	0.41	33.19		
					Yield	56.53	0.28	16.07		
		Responsiveness	0.54	Mre	Mre	Production loss	61.09	0.31	18.77	65.37
						The responsiveness of producing varied consumer orders	75.00	0.59	44.54	
						Production Efficiency	51.29	0.41	20.83	

		<i>Flexibility</i>	0.24	MF	Flexibility in making products	87.50	1.00	87.50	87.50
<i>Deliver</i>	0.12	<i>Reliability</i>	0.59		Product Shortage	29.44	0.30	8.78	57.39
					Service Level	69.27	0.70	48.61	
		<i>Responsiveness</i>	0.41	DRe	Lead Time of finished products	75.00	1.00	75.00	75.00
<i>Return</i>	0.10	<i>Reliability</i>	0.27		Internal Claim	36.64	0.57	20.79	32.86
					Customer Claim	27.91	0.43	12.07	
		<i>Responsiveness</i>	0.73	RRe	Time to replace damaged products	62.50	1.00	62.50	62.50

Table 8. Final Value of Dimensions

Variable	Dimension	SNORM (Score)	Value	Final Score (Score x Value)	Total each Dimension
<i>Plan</i>	<i>Reliability</i>	63.10	0.74	46.88	62.06
	<i>Responsiveness</i>	59.03	0.26	15.18	
<i>Source</i>	<i>Reliability</i>	81.38	0.22	17.84	74.29
	<i>Responsiveness</i>	62.50	0.54	33.70	
	<i>Flexibility</i>	94.17	0.24	22.75	
<i>Make</i>	<i>Reliability</i>	68.03	0.22	15.06	71.26
	<i>Responsiveness</i>	65.37	0.54	35.25	
	<i>Flexibility</i>	87.50	0.24	20.95	
<i>Deliver</i>	<i>Reliability</i>	57.39	0.59	33.62	64.68
	<i>Responsiveness</i>	75.00	0.41	31.07	
<i>Return</i>	<i>Reliability</i>	32.86	0.27	8.92	54.46
	<i>Responsiveness</i>	62.50	0.73	45.54	

Table 9. Total Value of GSCM Performance

Variable	SNORM (Score)	Value	Final Score (Score x Value)
<i>Plan</i>	62.06	0.21	13.04
<i>Source</i>	74.29	0.34	25.03
<i>Make</i>	71.26	0.24	16.80
<i>Deliver</i>	64.68	0.12	7.90
<i>Return</i>	54.46	0.10	5.18
Total Kinerja SCM			67.95

CONCLUSION AND SUGGESTION

Conclusion

Based on the data analysis and discussion that has been done, then there are some conclusions:

This study provides an overview of the condition of SCM PT. X that is based on the stages of the SCM process of PT. X in each section by taking company KPI data, it is known that there are two

stages of SCM that have low KPI values, namely manufacturing and distribution. The two stages are influenced by the three lowest KPIs, namely product shortage, internal claim and customer claim. The three lowest KPIs in the SCM flow of PT. X enters the manufacturing stage and product shortage KPIs enter the product distribution stage to consumers.

Green supply chain management PT. X using the SCOR method and the normalization process using the snorm de boer formula for the calculation of indicators and the results of the expert questionnaire are calculated to get the weighting of each matrix using the AHP method. Obtained the calculated performance value is 67.95. This value indicates that the achievement of the performance of green supply chain management PT. X is classified as average and needs to be improved, especially for indicators that have low values.

Proposed improvements can be made based on the results of weighting the variables using AHP to the weight with the lowest value. The results of the highest variable weight value are the source variable with a weight value of 0.34, make variable weight value of 0.24, plan variable weight value of 0.21, Deliver variable weight value of 0.12, and lowest variable return value of weight of 0.10 . Improvements can be made to the variable with the lowest value, namely return which has 3 KPIs, namely internal claim with a score of 36.64, customer claim with a score of 27.91 and time to replace a damaged product with a score of 62.5. Improvements related to claims both internal and consumer can be done by improving product quality and the quality of raw materials.

Suggestion

Based on the results of the research, discussion and conclusions, the researcher can provide advice or input to the company and subsequent research, among others :

SCM Conditions of PT. X was conducted to find out the description of SCM in PT. X to the phenomenon that occurs for the implementation of green supply chain management in the company. Companies can conduct performance evaluations for the stages of manufacturing and distribution processes that have the lowest value to be a priority in making improvements (continuous improvement).

Improvements can be made to KPIs that have low performance so that the level of achievement of the company's green supply chain management targets can be increased, but more deeply by considering the maximum gap limit and using the gap analysis method. In addition, companies should still maintain KPIs that have good performance.

Suggestions for the next research is to include other supply chain performance indicators that are not only in terms of raw materials consisting of reliability, responsiveness and flexibility, but also from the internal side of the company which consists of complete supply chain costs and asset management and SCM flow more broadly such as suppliers, distributors, retailers, to end customers to get more accurate SCOR-based supply chain performance calculation results so that performance results can be used as a reference in developing strategies and targets going forward.

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