

Supply Chain Management Performance Analysis Using SCOR (Supply Chain Operation Reference), and AHP (Analytical Hierarchy Process) Methods at PT YCH Indonesia Medan Branch

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ABSTRACT

This research was conducted to find out how the supply rate performance occurred at PT YCH Cab. Medan, Develop a supply chain performance preparation model so that it can be used as a basis for evaluating company performance. This research aims to find out and analyze supply chain performance at PT YCH Cab. Medan, to find out and analyze performance measurement comprehensively using SCOR and AHP methods. The method used in this study is quantitative with a population of 18 people, data collection techniques used are interviews, questionnaires and documentation. Data processing methods by performing normalization, AHP weighting, Calculation of the final weight of the supply chain process, Traffic Light System and Calculation of the overall performance of the supply chain. The results of this study obtained the red category on symbols S1.2, S2.2, S3.2, M1.3, D1.1, R2.1, R3.1 and R3.2. The company's performance is 74.2 in the Good Performance category. From these results, it can be concluded that the performance of PT YCH is good. Companies that are advanced and want to continue to grow will not be satisfied with good criteria, continue to improve existing conditions by continuing to innovate according to customer needs and requests to make a company with the Great Performance category.

Keywords: SCOR, AHP, Performance

BACKGROUND

PT YCH Indonesia is a family company that has been managed for generations. PT YCH Indonesia was founded in 1955 and started with simple passenger transportation. After the transition from father to son in 1970. Feeling that this business needs to be diversified Mr Yap Chwee Hock delegated to Mr Robert Yap in 1977, and started a cargo transportation business. Adjusting to the growth of the existing business, this business has also developed according to market needs not only in cargo transportation but also in supply chains business and expanded logistics services such as warehousing and shipping management. YCH itself is part of supply chain management, so from 2005 to date it has become the largest domestically growing supply chain solution company in Singapore with a leading regional supply chain management partner for many world-renowned brands throughout the Asia Pacific with the motto "Where SupplyChain Connects". The development of the logistics, distribution and transportation business continues to grow rapidly in Indonesia. Its growth provides promising opportunities through its growth predictions.

The Central Statistics Agency (BPS) reports the contribution of the transportation and warehousing sector (logistics sector) to the

Gross Domestic Product (GDP). The logistics sector includes warehousing (warehousing and transportation support services, as well as postal and courier services). Indonesia's logistics sector in 2019 was valued at 881.66 trillion, which means an increase of 10.51% from the previous year. The growth rate was higher than the previous year of 8.52%.

Competition with similar companies certainly emerges as partners or competitors. In terms of competition, the company will certainly continue to improve the quality of service to be able to compete and survive and become superior to similar companies. Knowing the company's performance is one way that can be used to be able to survive and excel in the competition. Performance is a description of the level of achievement of the implementation of an activity/policy program in realizing the goals, objectives, mission and vision of the organization contained in the formulation of the strategic plan (strategic planning) of an organization (Wibowo, 2010).

PT YCH, which is engaged in logistics, distribution and transportation, one of its biggest customers, is PT Frisian Flag Indonesia, which was present in Medan especially from 2005 to 2018 for logistics, distribution and transportation activities, and only serves transportation activities in 2019 until now. In 2018, YCH Medan carried out a supply chain business including warehousing and distribution

including transportation of all operational activities of PT Frisian Flag Indonesia (FFI) Customers. From 2019 until now warehousing is no longer a business activity run by YCH Medan, where YCH Medan only supports distribution activities related to transportation with a portion that has also decreased from 80% in 2019 for GT activities to 15% in 2020.

The reduction in terms of warehousing partnerships is a prediction that will occur if the PT YCH Medan branch itself does not increase warehousing standards that are appropriate for partnerships against customer desires, starting from warehouse feasibility, warehousing facilities, handling in warehouses, and this happened at the end of 2018 with the end of 2018 warehousing partners, and only handles partnerships in terms of transportation distribution.

The portion of the transportation partnership is also not completely the same as the previous portion. Distribution and transportation activities that are still being carried out are transportation that supports 100% of MT (Modern Trade) shipping activities within the city and only 15% of GT (General Trade) shipments considering that GT is in the city and only a few outside the city, from the delivery areas of GT Aceh and Sumbagut and Riau, which had previously been facilitated. The objectivity that is the target of the assessment in terms of transportation includes on-time delivery of MT and GT, POD Return, Customer Rejection and TAT performance.

Table 1. Average Usage of PT YCH Cab's Warehouse and Transportation Services at Medan Branch 2016-2020.

NO	Year	AVG Storage in PP (Pallet Position)	AVG Storage in ctn	AVG Transport by cartons		TOTAL
				MT	GT	
1	2016	575	141.567	49.756	87.080	136.836
2	2017	927	163.165	61.891	102.430	164.321
3	2018	984	111.390	56.650	109.650	166.300
4	2019	-	-	59.801	93.832	153.633
5	2020	-	-	66.391	65.362	131.753

From the data exposure above, there are several problems found, namely: (1) There is a reduction in the portion of partnerships from customers regarding warehousing and distribution services, (2) Seeing and analyzing how KPIs are used in the process of warehousing and distribution activities are carried out.

KPI as an assessment of good and bad performance can be seen in the achievement of distribution KPI targets including all operational activities as well as distribution and transportation, while KPI quality assurance (QA) is a complementary activity of all operational, distribution and transportation activities including accidents during delivery, Action repair, physical stock and system accuracy, delivery accuracy (MT and GT), Return of receipt of goods (POD return), customer rejection, delivery target time, wrong delivery of goods. Where in the KPI QA evaluation will

be carried out on the achievement of each activity by taking corrective actions.

Strengthening the quality of logistics services for "Customer Goods" or companies that produce ready-to-eat food and drinks, must be carried out with proper handling, starting from the process of receiving goods, the process of storing goods, the process of handling goods to consumers so that they can be consumed without doubting the quality and the quality of the goods is reduced or damaged due to improper handling. The supply chain concept is new in looking at logistics problems. In this new concept, logistics problems are seen as a broader problem that stretches very long from basic materials to finished goods used by the final consumer, which is the supply chain of goods. Therefore, it can be said that supply chain management is a logistics network.



Figure 1. The flow of receiving and distributing goods

The figure above describes the flow of goods receipts that will be stored in the YCH Medan warehouse and will be distributed throughout the Sumbagut, Aceh, and Riau areas for the distribution of GT and MT regarding all outlets around Medan. Based on the above explanation by looking at the flow of receipt and distribution of goods at YCH Medan, it is necessary to know the work performance of PT YCH Medan, starting from warehousing activities and distribution activities in detail using the SCOR and AHP methods with the aim that companies can evaluate supply chain performance in detail to carry out

monitoring and knowing where the company's position is relative to competitors, as well as determining the direction of improvement.

Research conducted by Anjas Handayanid and Christianto Yuppie Setyatama (2019) entitled "Analysis of Supply Chain Management Performance using the SCOR and the AHP Method, in which the performance index of each level is obtained and combines the overall levels so that the results of the company's work performance are obtained. The results of this study obtained a traffic light system, each level which is expected to be improved in the

future so that the company's performance can be better.

Research by Sri Witjaksono (Widiadibrata, 2018), under the title "Designing the Concept of Logistics Performance Measurement in Logistics Service providers" uses the APUK method. This research involves previous research on the performance of an activity (POA) which measures various dimensions, namely cost, time, capacity, capability, productivity, utilization and outcome. POA dimensions are carried out by synchronization and merging of dimensions which are summarized from 7 dimensions to 4 dimensions.

Research by Cundo (Harimurti, 2017), under the title "Improvement of Effective and Efficient Logistics System Performance", uses a SWOT analysis by evaluating each part, and designs using the Logistics Scorecard by determining KPIs

based on the Logistics Scorecard perspective. Making weighting KPIs, so that the results of each strengthening are 5 KPIs from a business strategy orientation perspective, 6 KPIs from a capacity planning and implementation perspective, 7 KPIs from a logistics efficiency and productivity perspective, 3 KPIs from an information technology implementation perspective, and 2 KPIs from a supply chain collaboration perspective.

Conceptual Framework

Based on the background of the problem, theory and journal reviews of variables used in measuring supply chain performance in terms of the five performance attributes contained in the SCOR model, namely: Reliability, Responsiveness, Flexibility, Cost, and Assets Management, the conceptual framework can be formulated as follows:

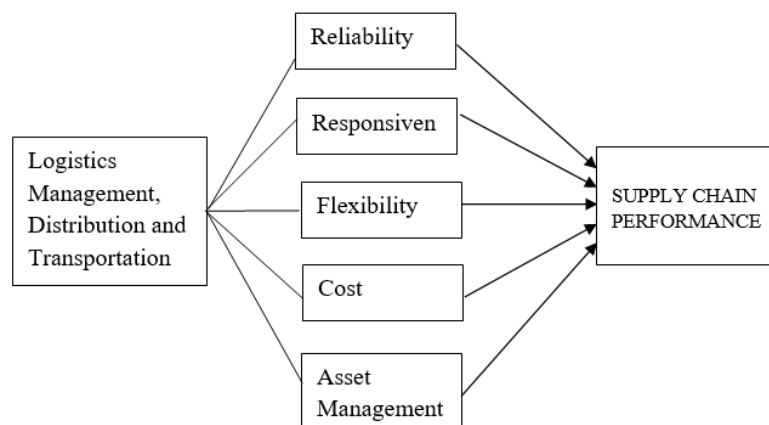


Figure 2. Conceptual Framework

RESEARCH METHOD

The research was conducted on logistics service companies, focusing on measuring supply chain management performance from the process of receiving goods, and handling, them to the customer. This type of research is quantitative. The study begins with conducting interviews and direct observations of general data and a description of the company's work methods, then continued with more in-depth observations on the process of storing and handling goods in the warehouse.

Data collection is the next stage consisting of supply chain mapping classification and determination of the SCOR Hierarchy model with adjustments to the company's supply chain activities. Supply chain mapping is obtained by observation and interviews with experts classified according to the 5 core processes of the SCOR model, namely planning, sourcing, manufacturing, delivering, and returning. This classification is used to construct a paired questionnaire SCOR model according to the SCOR model hierarchy the data management is done by:

- a. A Identify the matrix for each level using a performance measurement design based on the SCOR model by identifying the level 1 to 3 matrix obtained based on expert interview data.
- b. Verification of Key Performance Indicators (KPI); This verification is carried out to find out whether the designed SCM performance indicators are correct and by the company's 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.
- c. Weighting using the Analytical Hierarchy Process (AHP) the stages of weighting the KPI using the Analytical Hierarchy Process (AHP). This weighting is done to determine the level of importance of each level and KPI.
- d. Calculates the normalized value (score) of each metric using the normalization process or value scale equalization.
- e. The total value of SCM performance can be calculated by multiplying the value of the normalized score of each metric with the weighted value of the metric obtained from the results of weighting using AHP.

RESULT AND DISCUSSION

Hierarchical Arrangement

In compiling the hierarchy for determining supply chain performance measurement, it is focused on the 5 main supply chain processes in the score model, namely: plan, source, make, delivery and return as level 1, and then elaborated into 5 basic capabilities, namely: reliability (reliability), responsiveness (speed of response), flexibility (flexibility), cost (cost), and assets (assets), so that the supply chain performance measurement hierarchy is obtained which can be seen in Figure 3.

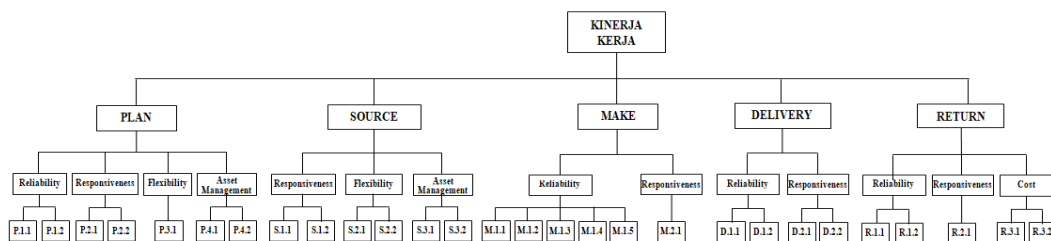


Figure 3. Hierarchy of supply chain performance arrangement

From the results of interviews with related parties, a hierarchical scheme can be arranged according to the criteria with a comparison of each level where the hierarchy has the main goal of obtaining a performance hierarchy where each element is lower, the more detail is observed.

The results of the preparation of this hierarchy will be compared with objectivity and KPIs. The objectivity which is a series of KPI activities is arranged with each KPI item based on the KPI type. The type of KPI is determined based on 3 categories, namely: Large the better, Smaller the better and Nominal the better. Determining the type of KPI is intended to be used as an indicator of the good or bad work

performance of an organization with the explanation: Large the better, the greater the value, the better the performance. Smaller the better, the smaller the value, the better the performance, and the nominal is better, usually a certain nominal value is set, the closer to the quality value, the better the performance.

Objectivity weighting is carried out to support or explain KPI theory in carrying out logistics management activities within PT YCH Medan. Where in the agility plan process of activities at the time of changes to orders, both products and the number of products is a category of flexibility. The source shows that agile HR (DE) points and trained HR (MH) in meeting customer

demands are asset management owned by the company. Furthermore, KPI activities at YCH Medan are made in activity reports

that are sent every monthly, weekly or daily period, which shows the extent of the activities carried out in achieving them.

Table 2. Key performance indicator weighting results

No	Code	KPI	Local Value	TOTAL VALUE
1	P.1.1	Total amount of DO released/Order fulfillment rate	0,793	0.034
2	P.1.2	Reconciliation of receiving orders (System) based on the initiative.	0.207	0.009
3	P.2.1	Inventory Accuracy	0.533	0.025
4	P.2.2	Cut-off conditions for receiving orders	0.467	0.022
5	P.3.1	Reduce Delivery of Wrong Items/Reduce Delivery of Wrong Items	1	0.051
6	P.4.1	Damaged goods in warehouse (Damage in warehouse)	0.722	0.049
7	P.4.2	Forklift Checklist	0.278	0.019
8	S.1.1	MT : Order must be a maximum of 3 points, and less than 4 Tons 6 M3. If the order is less than 3 points, the Tonage must be at least 2 tons.	0.677	0.038
9	S.1.2	Wrong batch delivery. Noted : MR : Issue	0.323	0.018
10	S.2.1	Tressibility (physical and system matching)	0.469	0.037
11	S.2.2	Reduce wrong Delivery (YCH Filter)	0.531	0.041
12	S.3.1	Trained HR in accordance with the established WI	0.072	0.051
13	S.3.2	WH Management: Damage in WH Accident in WH	0.298	0.022
14	M.1.1	Order Accuracy vs BPL	0.142	0.02
15	M.1.2	BPL vs Physical Accuracy	0.205	0.029
16	M.1.3	Performance Picker	0.266	0.032
17	M.1.4	DO + PO	0.223	0.031
18	M.1.5	DO vs PO	0.204	0.029
19	M.2.1	Service Level	1	0.07
20	D.1.1	Process Loading Accuracy	0.577	0.041
21	D.1.2	On time vs Failed	0.423	0.03
22	D.2.1	DO vs BPB	0.361	0.047
23	D.2.2	POD on Time	0.639	0.084
24	R.1.1	DO clean without repulsion	0.801	0.037
25	R.1.2	Product knowledge training	0.199	0.009
26	R.2.1	Service Level	1	0.055
27	R.3.1	Delivery Rejection	0.201	0.014
28	R.3.2	ReDelivery	0.799	0.056

Based on table 2, it can be seen that the lowest local weight value is found in the S 3.1 activity of 0.072 with the definition of trained human resources according to the established WI, but still covered by the overall weight with a value of 0.051. Furthermore, in the M 1.1 process where the accuracy of Order vs. BPL weights 0.142, the accuracy of HR here both data entry In and Out must be precise and accurate, considering that these activities are interrelated and when expenditure activities are carried out, they must ensure

compatibility both systemically and The manual to the Medan Logistics Coordinator, following R 1.2 of 0.199 indicates that product knowledge training activities are rarely carried out or carried out due to temporary needs and are only a formality. Based on each of the weighting results above, a hierarchy of supply chain performance measurements can be made and the weights for each perspective can be made. The hierarchy of supply chain performance measurements and their weights can be seen in Figure 4

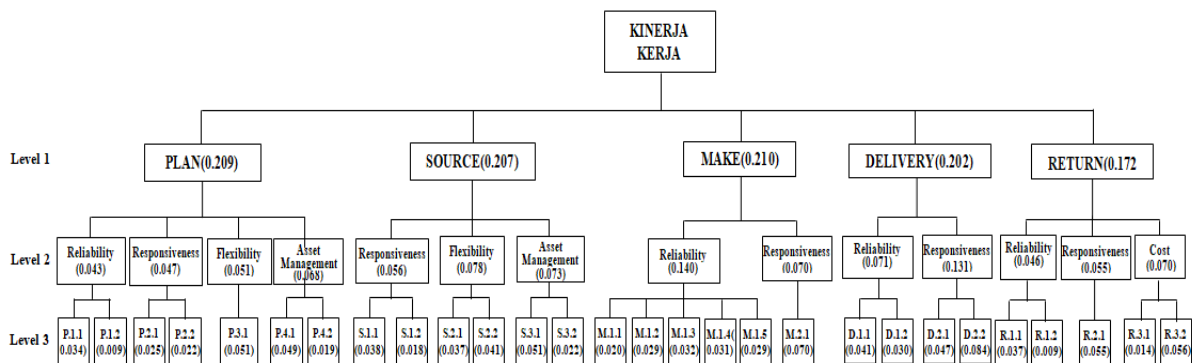


Figure 4. Hierarchy of Supply Chain performance measurement and KPI's value

The weighting of KPI scores is completed in the questionnaire activity. Respondents are expected to provide a KPI score for each of the existing activities by knowing whether the activity was carried out well or not. The weighting of the KPI scores is determined

based on the highest score in the good category, namely 9 and the lowest score in the bad category at 1. From the results of the weighting of the existing KPI scores, the overall KPI score for each activity is normalized in table 3.

Table 3. Table of KPI Scores and normalization.

NO	SYMBOL	OBJECTIVE	KPI	MEAN	NORMALIZATION
1	P.1.1	Fulfillment of Customer Request	Total amount of DO released/Order fulfillment rate	7.33	8.15
2	P.1.2	Reconciliation of receiving orders from customers which results in accuracy in fulfilling customer requests	Reconciliation of receiving orders (System) based on the initiative.	6.22	6.91
3	P.2.1	Speed in fulfilling customer requests	Inventory Accuracy	6.22	6.91
4	P.2.2	Delivery time speed	Cut-off conditions for receiving orders	5.89	6.54
5	P.3.1	The dexterity of activities at the time of changes to orders, both products and product quantities.	Reduce Delivery of Wrong Items/Reduce Delivery of Wrong Items	5.89	6.54
6	P.4.1	Storage method that facilitates the process of entering or removing goods.	Damaged goods in warehouse (Damage in warehouse)	6.17	6.85
7	P.4.2	Adequate means of transportation in the warehouse	Forklift Checklist	6.44	7.16
8	S.1.1	Respond to requests by classifying the type of Truck with the order received.	MT : Order must be a maximum of 3 points, and less than 4 Tons 6 M3. If the order is less than 3 points, the Tonage must be at least 2 tons.	6.56	7.28
9	S.1.2	Production error in determining the batch number	Wrong batch delivery. Noted : MR : Issue	6.39	7.1
10	S.2.1	Changes to orders with adjustments to customer requests or existing availability (DO Pending)	Tressibility (physical and system matching)	6.83	7.59
11	S.2.2	Double SO accepted for processing	Reduce wrong Delivery (YCH Filter)	6.28	6.98
12	S.3.1	Agile HR (DE) and trained HR (MH) in meeting demand	Trained HR in accordance with the established WI	6.33	7.04
13	S.3.2	WH Management: Pest Control Electrical Pendestrian Path	WH Management: Damage in WH Accident in WH	6.72	7.47
14	M.1.1	Adjusting product components (BN) from each incoming order with stock availability.	Order Accuracy vs BPL	6.5	7.22
15	M.1.2	Product collection according to BPL	BPL vs Physical Accuracy	6.44	7.16
16	M.1.3	Product checking based on Staffing	Performance Picker	6	6.67
17	M.1.4	Accuracy of completeness of shipping documents	DO + PO	7.06	7.84
18	M.1.5	Check no. PO on DO according to no. PO.	DO vs PO	6.94	7.72
19	M.2.1	Follow-up Case	Service Level	7	7.78
20	D.1.1	Handover of goods based on the staffing plan.	Process Loading Accuracy	7.11	7.9
21	D.1.2	TAT (Time Arrival Target)/ Delivery on Time	On time vs Failed	6.78	7.53
22	D.2.1	Conformity of goods sent (DO) with proof of receipt of goods in the market (BPB)	DO vs BPB	6.61	7.35
23	D.2.2	Proof of delivery of goods received by the customer (POD) Proof of Delivery (DO Matang)	POD on Time	7.11	7.9
24	R.1.1	Conformity of demand for goods with goods received	DO clean without repulsion	7.11	7.9
25	R.1.2	Driver n Helper ability in product understanding	Product knowledge training	6.83	7.59
26	R.2.1	Follow-up Case	Service Level	7	7.78
27	R.3.1	Items damaged or lost in transit	Delivery Rejection	6.67	7.41
28	R.3.2	Store Close	ReDelivery	6.94	7.72

From the comparison of KPI scores obtained by adjusting the types of existing KPIs, a TLS (Traffic Light System) table can be determined to be able to analyze each part that needs to be anti-spawned or changes to make improvements.

From the results of grouping based on the traffic light system, there are 5 categories of activities that need attention, with 8 points that need to be improved and 15 items that

are considered to meet the good category. From the findings and results of calculations and confirmation of existing data by knowing things that need attention and which need to be improved, the results of this study also calculate the existing performance of each activity carried out in the FFI product activity process with the results of calculating the overall operational performance FFI can be seen in table 4.

Table 4. Calculation of the performance of PT YCH Medan Operational Branch FFI

NO	BUSINESS PROCESS	VALUE LEVEL 1	ATTRIBUTE	VALUE LEVEL 2	KEY PERFORMANCE INDICATOR (KPI)	SYMBOL	VALUE LEVEL 3	KPI SCORE	FINAL VALUE	SCORE KPI NORMALIZATION x FINAL VALUE
1	PLAN	0,21	SC Reliability	0,21	Total amount of DO released/Order fulfillment rate	P.1.1	0,79	8,1	0,03	2,8
					Reconciliation of receiving orders (System) based on the initiative.	P.1.2	0,21	6,9	0,01	0,6
			SC Responsiveness	0,22	Inventory Accuracy	P.2.1	0,53	6,9	0,02	1,7
					Cut-off conditions for receiving orders	P.2.2	0,47	6,5	0,02	1,4
			SC Flexibility	0,24	Reduce Delivery of Wrong Items/Reduce Delivery of Wrong Items	P.3.1	1,00	6,5	0,05	3,3
SC Aset M	0,33	Damaged goods in warehouse (Damage in warehouse)	P.4.1	0,72	6,9	0,05	3,4			
		Forklift Checklist	P.4.2	0,28	7,2	0,02	1,4			
2	SOURCE	0,21	SC Responsiveness	0,27	MT : Order must be a maximum of 3 points, and less than 4 Tons 6 M3. If the order is less than 3 points, the Tonnage must be at least 2 tons.	S.1.1	0,68	7,3	0,04	2,8
					Wrong batch delivery.Noted : MR issue	S.1.2	0,32	7,1	0,02	1,3
			SC Flexibility	0,38	Traceability (physical and system tracking/investigation)	S.2.1	0,47	7,6	0,04	2,8
					Reduce wrong Delivery (YCH Filter)	S.2.2	0,53	7,0	0,04	2,9
			SC Aset M	0,35	Trained HR in accordance with the established WI	S.3.1	0,70	7,0	0,05	3,6
WH Management : Damage in WH, Accident in WH	S.3.2	0,30			7,5	0,02	1,6			
3	MAKE	0,21	SC Reliability	0,67	Order Accuracy vs BPL	M.1.1	0,14	7,2	0,02	1,4
					BPL vs Physical Accuracy	M.1.2	0,21	7,2	0,03	2,1
					Performance Picker	M.1.3	0,23	6,7	0,03	2,1
					DO + PO	M.1.4	0,22	7,8	0,03	2,4
					DO vs PO	M.1.5	0,20	7,7	0,03	2,2
SC Responsiveness	0,33	Service Level	M.2.1	1,00	7,8	0,07	5,5			
4	DELIVERY	0,20	SC Reliability	0,35	Process Loading Accuracy	D.1.1	0,58	7,9	0,04	3,2
					On time vs Failed	D.1.2	0,42	7,5	0,03	2,3
			SC Responsiveness	0,65	DO vs BPB	D.2.1	0,36	7,3	0,05	3,5
					POD on Time	D.2.2	0,64	7,9	0,08	6,6
5	RETURN	0,17	SC Reliability	0,27	DO clean without repulsion	R.1.1	0,80	7,9	0,04	2,9
					Product knowledge training	R.1.2	0,20	7,6	0,01	0,7
			SC Responsiveness	0,32	Service Level	R.2.1	1,00	7,8	0,06	4,3
			SC Cost	0,41	Delivery Rejection	R.3.1	0,20	7,4	0,01	1,0
ReDelivery	R.3.2	0,80			7,7	0,06	4,3			
TOTAL PERFORMANCE										74,2

The multiplication between KPI scores and the final weight of each activity is 74.2, according to Colby: 2000 the good performance indicator is in the 70-90 range, which means that the performance of PT YCH Medan, especially Operational FFI activities, is included in the good performance category.

CONCLUSION

1. The Traffic Light System shows each point that needs attention, namely: P1.2, P2.2, P3.1, P4.1 and S1.1 and those that need to be improved are: S1.2, S2.2, S3.2, M1.3, D1.1, R2.1, R3.1 and R3.2.
2. Inadequate warehouse facilities make customers choose other warehouse alternatives according to their needs by switching to competing companies.
3. Logistics management performance of PT YCH Medan is 74.2 meet the "Good Performance" criteria.

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