

PERFORMANCE MEASUREMENT ANALYSIS OF OUTBOUND DELIVERY PROCESS ON PANEL PRODUCTS AT PT. WILMAX CONTROL SYSTEM

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Abstract. *PT Wilmax Control System is a company engaged in manufacturing, servicing and selling components related to pneumatic- hydrolic and electrical control panel systems. Products in the form of panels are generally used in the oil and gas industry, especially on offshore platforms, to get the final product. In this study, the authors used a descriptive qualitative method that aims to understand events or phenomena regarding the outbound delivery picture in the company, the ultimate goal of researchers is not generating a new theory, but assessing or evaluating. data collection methods are carried out by interviewing and filling out questionnaires and then analyzed using the SCOR method, AHP, and weighting the KPIs of the outbound delivery business process at PT Wilmax Control System In order to implement performance measurement of the outbound delivery process, the authors have identified PT Wilmax Control System stakeholders involved in the outbound delivery process by utilizing the SCOR method through a series of interviews, and filling out questionnaires. Based on adjustments to the company's conditions, this research only uses 3 attributes in the core deliver process, namely reliability, responsiveness, and agility and focuses on the deliver section in accordance with validated KPIs. There are 8 performance indicators and those selected are in accordance with the company's circumstances. The results of the selected indicators can be done*

Keywords: *Performance measurement analysis, Outbound delivery, SCOR, AHP and KPI weight Introduction.*

1 Intrudaction

Outbound delivery is important for many companies because it directly connects with customers in the value chain. Market and customer demands for quality, speed, and information and service orientation of the delivery process are crucial in terms of overall evaluation and satisfaction. Good performance will certainly determine the quality of the company itself, Improving the performance of a company is not always related to improving financial performance, so it is appropriate that the view of company performance in the long term is not only viewed from the financial side but also non-financial such as internal business processes, capabilities and commitment of its personnel (Srimindarti, 2004).

PT Wilmax control system is a company engaged in manufacturing, servicing and selling components related to pneumatic-hydraulic and electrical control panel systems. Products in the form of panels are generally used in the oil and gas industry, especially on offshore platforms, to get the final product. Seeing the condition of PT Wilmax in July - December 2023 is categorized as not good due to delays in the outbound delivery process because during the ordering process there have been several delays in delivering goods to customers, of course resulting in customer complaints. The internal causes of this delay are lack of coordination from one department to another, individual negligence such as the approval document requested is not immediately given so that the procurement of goods is delayed.

2 Theoretical and Literature Review

2.1 Theoretical Studies

Performance Analysis

Performance Analysis

Performance is a very important role to be considered by all management, both at the large and small organizational levels, the results of employee performance are a form of accountability for something that plays an important role in the success of an activity, which is influenced by the ability, accuracy, skills and nature of each individual. According to (Moehariono, 2012). performance or Performance is a description of the level of achievement of the implementation of an activity program or policy in realizing the goals, objectives, vision, and mission of the organization as outlined in an organization's strategic planning.

Outbound Delivery.

Delivery is of utmost importance as consumers want quality products/services at affordable prices and in the required quantity at the specified time. Of course, affordable and high-quality products and services with delayed delivery are practically useless to consumers, just as high-quality products and services delivered on time but at a very

high price, with competitive prices and timely delivery will not make up for the lack of product/service quality.

Outbound delivery is the movement of products out of the factory or operating office to customers or consumers (Bloomberg et al., 2002). Distribution and outbound processes are very important for companies because they directly connect with customers in the value chain.

Supply Chain Operations Reference (SCOR)

The Supply Chain Council (SCC) is credited with developing and first putting forth the SCOR technique. The SCOR approach allows for the measurement and improvement of a company's complete supply chain. The model takes into account elements that have an impact on the complete supply chain, such as supply forecasting, delivery, demand fulfillment, inventory and asset management, production flexibility, assurance, process costs, and others (SCC, 2012) in five primary elements serve as a guide for supply chain activities when SCOR is implemented. Plan (A process that balances demand and supply to determine the best course of action), Source (The process of procuring goods or services to fulfill demand), Make (The process of transforming raw materials or components into a product that customers want), Deliver (The process of fulfilling customer demand for goods or services), and Return (The process of returning or accepting the return of products for various reasons by consumers). The SCOR model can also describe performance attributes and indicators in supply chain measurement. The performance attributes in question are supply chain criteria that can analyze and evaluate the supply chain.

Analytical Hierarchy Process (AHP)

Analytical Hierarchy Process (AHP) is one method that can be used as a decision-making system in a company. AHP is a process of solving complex multi-criteria problems so that it becomes a conceptualized arrangement. AHP describes complex multi-factor or multi-criteria problems into a hierarchy. a complex problem can be broken down into groups which are then organized into a hierarchical form so that the problem will appear more structured and systematic (Putri & surjasa, 2018).

Key Performance Indicator (KPI)

Key Performance Indicator (KPI) is a decision-making tool or matrix that is useful to facilitate organizations or companies in measuring individual performance and helping to evaluate the performance of the organization itself to achieve its strategic vision goals (Sodexo, 2021). KPI identification is used to determine whether the benchmarks that have been made are in accordance with the needs of supply chain performance measurement in the company. This identification is carried out through the interview stage and filling out a questionnaire (Kinanti & Nurhasanah, 2019).

Normalization of Snorm De Boer

Snorm de Boer normalization is a formulation for measuring snormalisation, in measuring performance, normalization is needed for each indicator to align the parameters in each work indicator, this is because each work indicator and its weight have different parameters so Snorm de Boer normalization is needed to align. According to [Normalization has an important role in achieving the final value of performance measurement, there are several ways to measure performance, and performance fulfillment is defined by normalizing performance indicators. Normalization calculations can use the following formula:

<p>Lower is better:</p> $S_{norm} = \frac{S_{max} - S_i}{S_{max} - S_{min}} \times 100$ <p>Highter is better:</p> $S_{norm} = \frac{S_i - S_{min}}{S_{max} - S_{min}} \times 100$

Equation 1 Snorm De Boer Formula

Information:

S_i = Value of real indicator achieved

S_{min} = Lowest performance gain score

S_{max} = The highest performance gain value of the performance indicator.

2.2 Conceptual Framework

The conceptual framework serves to determine the KPIs that will be the basis and reference in measuring outbound delivery performance in the company. The score of each KPI will be used as a reference to improve the company's outbound delivery performance. to improve the company's outbound delivery performance. The following is the conceptual framework in this study, this research can be seen in Figure 1 below.

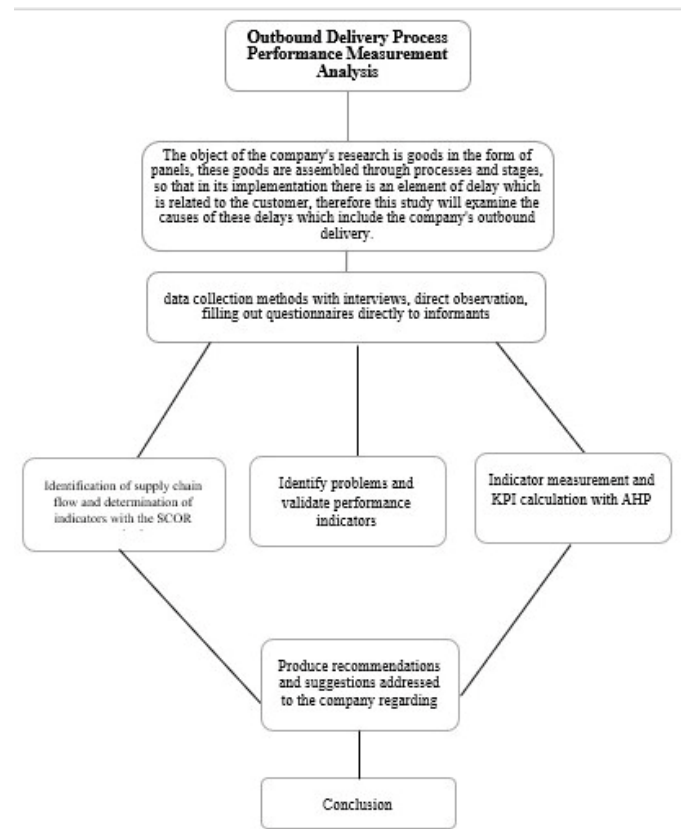


Fig. 1. Research Framework

3 *Research Method*

3.1 **Research Method**

In this research, the author uses a descriptive qualitative method which aims to understand events or phenomena in more depth, the ultimate goal of the researcher is not generating a new theory, but assessing or evaluating.

In the field investigation stage, an introduction and understanding of the company situation, interviews, filling out questionnaires regarding assessment indicators and formulating constraints according to the local situation are carried out. This research uses non-probability sampling to determine the sample, the sample is not randomly selected, and not all items or elements of the population have the same probability to be sampled. The informants in this study were 2 people, namely the logistics department and the project execution team.

This research will be carried out during the internship period, which is for 8 months at PT Wilmax Control System located at Puri Industrial Park 2000 Blok C, No. 1 Batam Center, the object of this research is to identify outbound delivery activities.

Data Collection Techniques

In this research, data collection will be using triangulation data method in obtained data to increasing the accuracy of data by using more than one technique in collecting research data. The techniques in this research are interview, questionnaire to gain more detailed information.

Data Analysis Technique

Problem Identification In this first step, identify the results of statements and data from the previous data analysis process and observe the outbound delivery process at the company. Second step is validation of Performance Indicators this is the stage of determining the indicators used by the company, which are quite comprehensive in measuring the performance of the outbound delivery process. The company's ability to fulfill orders on time and measure delivery quality and customer satisfaction. (Neely et al. 2019)

Calculation of Performance Indicators this section aims to find out about the supply chain flow using SCOR and ensure what indicators will be used as the next assessment. The calculation of the value of performance indicators is carried out using actual data that has been collected, questionnaires and interviews to related parties for qualitative data. Fourth step is weighting of Performance Indicators at this stage, the weighting will be carried out using the AHP method and produce a KPI assessment to determine the evaluation results based on the weighting that serves for decision making, and perform calculations based on Snorm De Boer and then to get the conclusion of the calculations in the preparation of the traffic light system.

And last step is drawing Conclusions after obtaining the evaluation results from several previous stages, of course, in the end, conclusions will be drawn on the causes of the problems that occurred which were initially ambiguous with this final conclusion that will produce the answers formulated in the problem formulation and answer the research objectives.

4 Result and Discussion

4.1 AHP Performance Indicator Weighting With Expert Choice

Key Performance Indicators (KPI) weighting is used to determine the level of importance of each KPI. Each KPI because each KPI has a different level of importance. All KPIs obtained have gone through the through the validation stage through a questionnaire distributed to company experts. Weighting using Analytic Hierarchy Process (AHP) and processed with expert choice software. First stage

The first stage of weighting consists of data collection through questionnaires in the form of pairwise comparisons. pairwise comparison. The questionnaire was completed by 2 resource persons.

Table 1. AHP

Business Process	Attribute	Weighting Level 2	Key Performance Indicator (KPI)	Weighting Level 3
Deliver	Reliability	0,682	Delivery Quantity Accuracy	0,669
			Commit Date	0,243
			Shipping Accuracy	0,88
	Responsiveness	0,216	Pick To Ship Cycle Time	0,682
			Deliver Cycle Time	0,216
			Customer Response Time	0,103
	Agility	0,103	Upside Deliver Flexibility	0,166
			Downside Deliver Adaptability	0,833

In table 1. level 2 reliability indicators have a weight value of 0.682, responsiveness 0.216, and agility 0.103. And the indicator at KPI level 3 has a delivery quantity accuracy weight of 0.669, commit date 0.243, shipping accuracy 0.88, then pick to ship cycle 0.682, deliver cycle time 0.216, and customer response time 0.103. After calculating the final performance using the SCOR method.

4.2 Calculation of Key Performance Indicator (KPI) Data

Next is to calculate the Key Performance Indicator (KPI) data that has been obtained from the company (see Table 2), all data processed is data related to the supply chain and Key Performance Indicator (KPI), data collected from July to December 2023 The following is one of the company's KPI calculations for the outbound deliver section. *Deliver Performance Accuracy July-August 2023 (The higher percentage the better)*

$$Si = \frac{\text{Number of Orders Delivered}}{\text{total order}} \times 100\%$$

$$Si = \frac{36 \text{ panel}}{43 \text{ panel}} \times 100\% = 83\%$$

From the calculation results, the delivery performance accuracy performance values in each of the 2 months of July, August, September, October, November and December 2023 are 80%, 100%, 100%, 72%, and 67%, respectively.

Table 2 Key Performance Indicator Data

Process	Performance indicators	Actual Value (Year 2023)				
		Jul-Aug	Aug-Sept	Sept-Oct	Oct-Nov	Nov-Dec
Deliver	Delivery Quantity Accuracy	80%	100%	100%	72,7%	67%
	Commit Date	20%	100%	100%	27%	30%
	Shipping Accuracy	0	0	0	0	0
	Pick To Ship Cycle Time	3	3	3	3	3
	Deliver Cycle Time	3	3	3	3	3
	Customer Response Time	45 Hari	35 Hari	35 Hari	45 Hari	40 Hari
	Upside Deliver Flexability	0	0	0	0	0
	Downside Deliver Adaptability	80%	100%	100%	72%	66%

It can be seen in the table above that each indicator from July to December has an actual value, namely, in the delivery quantity accuracy indicator in July - August 80%, August - September 100%, September - October 100%, October - November 72%, November - December 67%. Furthermore, in the commit date indicator 20%, 100%, 100%. 27%, 30%. The shipping accuracy indicator has a value of 0 because the number of shipments in July - December 2023 was sent in accordance with the completeness of the documents. Furthermore, the pick to ship cycle time and deliver cycle time indicators have a value of 3 which means that the value is sufficient in the delivery time range, and finally the downside deliver and upside deliver which are worth 80%, 100%, 100%, 72%, and 66% in the vulnerable time of July - December.

4.3 Analysis of SCOR Performance Matrix Calculation Results and Recommendation of Improvement Suggestions

After calculating the final performance using the SCOR method, to make it easier to identify and analyze the description of the performance measurement results, it is necessary to apply the Traffic Light System (TLS) method, according to Pulansari & Putri, (2020) there are three color indicators in the Traffic Light System (TLS), namely red, yellow, and green. A red indicator is given if the Snorm De Boer value produces a performance value of ≤ 50 , meaning that the performance is poor, if the indicator is yellow then the performance is poor.

Furthermore, the commit date KPI has a yellow indicator with a score of 58 which can be said to be marginal or quite good. Furthermore, shipping documentation accuracy has a green indicator with a score of 100 because the percentage of the number of goods shipped with documents is fulfilled. Furthermore, the pick to ship cycle time is yellow with a value of 70 which can be categorized as sufficient in accordance with the benchmark assessment at the company, namely with a value of 3.

Furthermore, in the deliver cycle time section with a yellow indicator, it is considered sufficient with the delivery conditions by the company to the customer. Furthermore, the customer response time gets a red indicator, this is because the company's performance in the process is delayed within the agreed time period with the customer. Furthermore, the upside deliver which is related to the increase in orders, because according to the informant, the performance of the company in the month of March 2020 is considered sufficient.

Table 3 Traffic Light System

Business Process	Attribute	Key Performance Indicator (KPI)	Actual Value (Si)	Min	Max	Snorm
Deliver	Reliability	Deliver Quantity Accuracy	83	67	100	48
		Commit Date	58	20	100	58
		Shipping Accuracy	100	0	100	100
	Responsiveness	Pick To Ship Cycle Time	3.0	1.0	5.0	70
		Deliver Cycle Time	3.0	1.0	3.0	70
		Customer Response Time	45	35	40	50
	Agility	Upside Deliver Flexibility	100	0	100	100
		Downside Deliver Adaptability	84	66	100	70

In table 3. it can be seen that the deliver process has 3 attributes and 8 Key Performance Indicators (KPIs), namely deliver quantity accuracy, commit date, shipping accuracy, pick to ship deliver, deliver cycle time, customer response time, upside deliver flexibility and downside deliver adaptability. In the KPI deliver quantity accuracy has a red indicator with a score of 48 which can be said to be bad, this is due to the low accuracy of the quantity of shipments by the company.

5 Conclusion and Suggestions

5.1 Conclusions

Based on the results of data processing and analysis, the conclusions that can be drawn from this research are there are 8 performance indicators and those selected according to the company's circumstances. The results of the selected indicators can be calculated for performance measurement, so that they can find out what indicators need to be improved. The performance value of Outbound deliver at PT Wilmax Control System in July - December 2023 is categorized as not good and unsatisfactory where the performance value in July - August 2023 is 80, August - September 100, September - October 100, October - November 62, November - December 67 or with an average value during July to December 2023 is 68.16. There are several performance indicators that have not reached the targets set by the company, these performance indicators are data quantity accuracy and customer response time.

The root of the problem is caused by delays in delivery that occur due to lack of coordination between one department to another, individual negligence such as approval documents requested are not immediately given, there are limitations in employee performance so that in the process of shipping goods are not delivered as requested, procurement of goods is delayed where PT Wilmax itself is a company that assembles the panels, but not only that, Wilmax is also an assembly company where semi-finished goods will be processed further so that they become one item (panel).

Another thing is also caused because, the shipping destination of the goods made is not only sent domestically, but outside the country where the goods are done by request from the customer, so that when the goods are ready the company needs to confirm that it is appropriate, this is the cause of delivery is also late because the customer will usually provide a review on the project being worked on.

5.2 Suggestion

This performance measurement is expected that the company can evaluate or take the right policy in the performance of each indicator on outbound delivery, so that the company can know the development of performance and can make improvements. Improvements can be made to performance indicators that are still low, so that the company's achievement level can be increased again. In addition, PT Wilmax control system also maintains performance indicators that have good performance.

PT Wilmax should provide briefings on outbound deliver performance to employees so that these activities can be well coordinated and can be evaluated. Performance appraisals should be carried out periodically, so that continuous improvement can be made. The company should compile all information and data in a complete, easily accessible and well-documented and organized manner so that it is easy to collect data for performance measurement.

For future researchers, it is recommended to use the development method of AHP, namely Fuzzy AHP which is used as a weighting criterion to get more complex results..

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