Designing Performance Improvement Strategy in Automotive Companies Using SCOR Model and Importance Performance Analysis

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Abstract. This research begins by determining and validating indicators (KPIs) that will be used to measure performance in the company’s supply chain, and making questionnaires to compare priorities between indicators and also each attribute and process at each SCOR level. This study has five general processes of supply chain. Each process is further divided into several attributes that are included at level two within the SCOR framework, namely reliability, responsiveness, flexibility, cost, and assets. Furthermore, each of these attributes has a total of 49 performance indicator indicators. The next step is to validate and ensure each indicator can be measured in research by holding discussions with the company. This paper aims to obtain the value of the company’s supply chain performance to determine the supply chain performance improvement strategy of PT. X so that the performance of the company’s supply chain can improve.

Index Terms — Supply Chain Operations Reference, Analytical Hierarchy Process, Importance and Performance Analysis. Performance Measurement, Supply Chain, Automotive Industry

1. Introduction

Supply chain has become an important focus to gain a competitive advantage for companies that do business (Sukati et al., 2012). To be able to make profit for company, companies need to increase the efficiency of their company’s supply chain in order to reduce their costs (Delipinar and Kocaoglu., 2016). The evolving and dynamic nature of supply chains presents many interesting challenges for effective system coordination (Yusuf et al., 2014).

The industrial world is developing very fast. This causes very fierce competition between existing companies. According to Chopra and Meindl (2007) Supply Chain Management (SCM) is needed when an industry wants to meet their customer satisfaction, with the availability of their products. Consumers will be satisfied if the product is sent in the right amount and in the right time, service level is a very important factor in the design consideration of a supply chain.

One of the developing industrial sectors in Indonesia with a significant contribution to the Indonesian economy is the automotive industry (Ministry of Industry, 2019). The automotive industry is one of the sectors that the Ministry of Industry focuses on to be developed in the near future (Ministry of Industry, 2019).

PT. X is an automotive manufacturing company that produces commercial vehicles in Indonesia. The company which manufactures truck vehicles has produced 41,354 truck units in 2019 (Data of PT. X). President Director of PT. X, Atsushi Kurita (2019) has predicted that the commercial vehicle market
will increase by 7% in 2020. They increased their production target to 46,900 units by 2020. Increased by about 5,000 units compared to the actual number of production in 2019.

In the commercial vehicle market in Indonesia, PT. X faces competition from other companies. In March 2019, surprisingly other trucking companies could shift PT. X as the largest commercial vehicle market holder in Indonesia. In addition, in the production field of PT. X, there are still some complaints from employees regarding supply chain conditions. The management still cannot observe and find out the root of the problem, because there is no specific performance measurement up to the company's field. One of the causes of this problem is the supply chain performance in the company that has not been optimal. The condition of supply chain performance that is not optimal can provide losses for the company. The causes of supply chain performance that is not optimal can be known by measuring supply chain performance in the company. Measurement of supply chain performance is important for companies to be able to implement supply chain management well (Lee and Billington, 1992). Therefore, companies need to measure supply chain performance to improve their company's supply chain performance. Then, after the measurement of supply chain performance is carried out, it is continued with the establishment of improvement strategies to improve the performance of the company's supply chain indicators that are not good.

2. Methodology

2.1 Identification of Supply Chain Performance Measurement Indicator.

This research begins by determining and validating indicators (KPIs) that will be used to measure performance in the company's supply chain, and making questionnaires to compare priorities between indicators and also each attribute and process at each SCOR level. This study has five general processes of supply chain. Each process is further divided into several attributes that are included at level two within the SCOR framework, namely reliability, responsiveness, flexibility, cost, and assets. Furthermore, each of these attributes has a total of 49 performance indicator indicators. The next step is to validate and ensure each indicator can be measured in research by holding discussions with the company. There are 29 performance indicators on level 3 indicators that are declared valid by the company and can be used to measure the performance of the company's supply chain that show on table below:

### Table 1. Performance Indicator

| Supply Chain Process (Level 1) | Attributes (Level 2) | Performance Indicator (Level 3) |
|-------------------------------|---------------------|---------------------------------|
| Plan                          | Reliable            | A.1.1 Percentages of Production Unit to Production Planning |
|                               |                     | A.1.3 Plan Employee Reliability |
|                               |                     | A.1.5 Finished Goods Inventory Level |
|                               | Responsiveness      | A.2.2 Time to Make Production Schedule |
| Source                        | Reliable            | B.1.1 Supplier Fill Rate |
|                               |                     | B.1.2 Percentages of Correct Quantity of Order Deliveries |
|                               |                     | B.1.3 Source Employee Reliability |
|                               |                     | B.1.4 Supplier Reliability |
|                               | Responsiveness      | B.2.4 Number of Container Late Arrival |
|                               | Flexibility         | B.3.4 Supplier Flexibility |
| Make                          | Reliability         | C.1.3 Number of Manpower |
|                               |                     | C.1.4 Product Part Failure in |
| Deliver | Trimming Process |
|---------|-----------------|
|         | C.1.5 Employee Reliability in Trimming Process |
|         | C.1.6 Manpower Sick Leave Rate |
|         | C.1.7 Production Productivity |
|         | C.2.2 Trimming Process Lead Time |
|         | C.2.3 Time Consume of part set |
|         | C.2.4 Waktu Penanganan kerusakan |
|         | C.3.2 Production Volume Flexibility |
|         | C.4.1 Labor Cost |

| Reliability | D.1.1 Delivery Fill Rate |
|-------------|--------------------------|
|             | D.1.2 Damage Free Delivery |
|             | D.1.3 Deliver Employee Reliability |
|             | D.1.5 Delivery Productivity |
|             | D.3.2 Flexibility in Finished Good Delivery |
| Reliability | E.1.2 Number of Customer Complaint |
|             | E.1.3 Return Employee Reliability |
| Flexibility | E.3.1 Flexibility in Replacing Defect Products to Customer |

### 2.2 Weighting of Performance Indicators

The next stage is determining the weights for each performance indicator, this aims to determine the level of importance of each performance indicator. This weighting is based on the results of the pairwise comparison questionnaire. This questionnaire is filled out by the management of the company which consists of four people. These people, are people who understand the condition of the company's supply chain and also people who have the authority to make company decisions related to the supply chain of the company. This weighting process is using the AHP method and assisted with Expert Choice 11 software. The pairwise comparison questionnaire is carried out in three stages at each SCOR level for research respondents. Calculations from Expert Choice 11 software generate weights for each indicator. The weight was obtained from the pairwise comparison results combined from the experts.

### 2.3 Company Supply Chain Performance Calculations

After the weights of each indicator at each level are obtained, performance of the company's supply chain can be calculated in 2019 based on the SCOR model framework. The following are the steps in measuring the performance of a company's supply chain.

1. Determine the characteristics of each Performance Indicator. Each performance indicator has different characteristics, these characteristics are achievement targets, type of scoring system, and also units.

2. Calculating achievement of performance indicators. The calculation of the achievement of each performance indicator is based on secondary data from the company, the data is in the form of company documentation data in 2019 in each month.

3. Performance indicators normalization. The actual achievement value that has been measured has different units and characteristics. To uniform the characteristics of each performance indicator, the data is carried out Normalization. Normalization is done using the Snorm de Boer equation

4. Index performance measurement. Performance Index scores are calculated to determine the relative performance value of each indicator against their respective local weights, and to find out the achievement values at the next levels. The sum of level 3 performance indexes results in level 2
performance values, the sum of level 2 performance indexes results in level 1 performance values, and the sum of level 1 performance indexes results in overall performance values.

3. Research Result
On the first step, actual performances value of 29 performance indicator from January to December are collected. Then, that actual data is normalized using the Snorm de Boer equation. After normalizing and calculating the level 3 performance index by multiplying the level 3 performance values by their respective weights, we got the performance value for level 2 SCOR which contains the performance attributes on the customer facing aspect. In this research, level 2 SCOR performance value used are reliability, responsiveness, flexibility and cost. Then, the supply chain performance index is calculated according to SCOR level 2 and SCOR level 1 performance value that contains the general processes in the supply chain can be obtained as shown on the following table.

| SCOR Attribute | Jan | Feb | Mar | Apr | May | Jun |
|----------------|-----|-----|-----|-----|-----|-----|
| Plan           | 90% | 80% | 91% | 91% | 79% | 83% |
| Source         | 72% | 68% | 69% | 79% | 50% | 73% |
| Make           | 65% | 64% | 62% | 67% | 69% | 62% |
| Deliver        | 99% | 91% | 98% | 96% | 100%| 100%|
| Return         | 76% | 70% | 89% | 89% | 76% | 83% |

Table 3. SCOR level 1 Performance Value (Jul-Dec)

| SCOR Attribute | Jul | Augs | Sep | Oct | Nov | Dec |
|----------------|-----|------|-----|-----|-----|-----|
| Plan           | 88% | 83%  | 78% | 91% | 88% | 89% |
| Source         | 78% | 74%  | 73% | 84% | 76% | 72% |
| Make           | 70% | 70%  | 71% | 61% | 65% | 74% |
| Deliver        | 100%| 100% | 100%| 100%| 100%| 100%|
| Return         | 63% | 96%  | 83% | 89% | 89% | 89% |

From the table above, we can see the performance value of each supply chain process or SCOR level 1 in every month in 2019. You can see that the make process has the worst value, and the delivery process is the process with the best value. Then the supply chain performance index is calculated according to SCOR level 1 to get the value of supply chain performance according to SCOR as a whole as shown below.

Table 3. Supply Chain Performance Value

| Months     | Supply Chain Performance Value |
|------------|--------------------------------|
| January    | 82.57%                         |
| February   | 75.42%                         |
| March      | 82.36%                         |
| April      | 84.92%                         |
| May        | 74.18%                         |
| June       | 79.86%                         |
| July       | 83.13%                         |
| August     | 82.17%                         |
| September  | 79.34%                         |
| October    | 85.74%                         |
| November   | 83.52%                         |
| December   | 84.46%                         |
The table above shows the value of the company's overall supply chain performance in each month in 2019. Can be seen in the table above, the worst performance occurred in May, while the best performance occurred in October. Based on those result in the table III, the average of supply chain performance index of the Company in 2019 is 82.14%.

4. Result Discussion

Based on the Traffic Light System grouping system from Trienekens and Hvolby (2000) which divides performance achievements into 5 categories. The first category is "Excellent" with a performance value above 90%, after that there is "good" category with range of numbers between 70% to 90%, then there is "average" category with a range number between 50% until 70%, after that there "Marginal" category which has a range of numbers between 40% to 50%, and the last there is "Poor" category for numbers below 40%. The following results from this research are obtained below:

1. Overall, the achievement of the company's supply chain performance in 2019 has entered into a good category, there are only 4 months that have a figure below 80%. However, based on the target owned by the company and also evidence of the decline in competitiveness of the company, the company should be able to improve its performance and achieve excellent value on the value of their supply chain performance.

2. On SCOR level 1 which contains processes in the supply chain, the Make process at the company is the process that has the worst value. The Make process has a value of 66.5% which falls into the average category. For other processes, namely Plan, Source, and Return are included in the good category. Meanwhile, the Delivery process has entered into the excellent category with a figure of 98.6%.

3. On SCOR level 2 which contains the performance attributes, there are some indicator that still falls into the category of “average” value, namely make-cost, make-reliability and source-reliability. Meanwhile, there are four performance attributes that have been included in the “excellent” category, namely plan-reliability, delivery-reliability, delivery-flexibility and return-flexibility. And the remaining performance attributes fall into good category.

After measuring the performance of the company’s supply chain, the performance value and importance of SCOR and AHP are also obtained. To find indicators that have below average performance values but are considered important by the company, we can find out by using the Importance Performance Analysis (IPA) method. From this IPA method it can be seen which indicators need to be improved at level 3 through the mapping of indicators which can be seen in Figure 2 below:

**Figure 1. IPA Quadrant Graphic**

Indicators that need to be improved are the indicators that fall into the quadrant i. From Figure 2 above, it is known that there are five indicators included in quadrant i, namely Finished Goods
Inventory Level (A.1.5), Time to make production schedule (A.2.2), Supplier fill rates (B.1.1), Percentages of Correct Quantity of Order Deliveries (B.1.2), and Labor costs (C.4.1). After that, discussions with the company and the proposed performance improvement strategies that can be carried out by the company can be seen in Table 4 below:

**Table 4. Proposed Strategy**

| Code | Proposed Strategy |
|------|-------------------|
| S1   | Improve good relation with suppliers (Krause et al., 1998) |
| S2   | Integrated data usage (Immawan T & Nugraha I, 2020) |
| S3   | Supplier Outsourcing (Li S et al., 2017) |
| S4   | Understanding Market Conditions to produce accurate forecasting (Wigaringtyas, 2013) |
| S5   | Employee Job-lists and Employee Job-desc prioritization Implementation |
| S6   | Reward and Punishment (Gitosudarmo, 2000) |
| S7   | Improve communication between divisions that involved in production process (Wigaringtyas, 2013) |
| S8   | Conduct regular employee training |
| S9   | Repair damaged machines in the painting process |
| S10  | Changes the production schedule timeline |

Because the company has limited resources namely cost, time, and workers. Then the proposed performance improvement strategy in the above table needs to be determined in priority, so that the company knows what strategies can be done first. Therefore, the prioritization matrix is needed as a tool to determine the proposed improvements that should be prioritized by the company to do.

The prioritization matrix is carried out by determining the correlation between the proposed performance improvement strategies and the performance indicators that will be improved. A strong correlation is given a value of 9, an intermediate correlation is given a value of 3, and a weak correlation is given a value of 1, whereas if there is no correlation it is not. This correlation shows how much impact each proposed improvement can have on each performance indicator. In this matrix, the difficulty level of each implementation of a performance improvement strategy in the form of a Likert Scale is also given.

After being given an assessment of the correlation of each strategy with the indicators. The difficulty level of implementation for each proposed strategy is also determined using a Likert scale. From the Prioritization Matrix, it can be determined the correlation of each proposed strategy with each indicator to be improved. After calculating, a rating is obtained for each proposed improvement. This ranking is determined by the effectiveness of the strategy implementation and also based on the difficulty of implementing it based on the company's resources.
Table 5. Proposed Strategy Ranking

| Rank | Proposed Strategies                                                                 | Code     | Indicator                                      |
|------|-------------------------------------------------------------------------------------|----------|------------------------------------------------|
| 1    | [S5] Employee Job-lists and Employee Job-desc prioritization Implementation          | A.2.2    | Time to make production schedule               |
| 2    | [S10] Changes the production schedule timeline                                       | A.2.2    | Time to make production schedule               |
|      |                                                                                    | A.1.5    | Finished Goods Inventory Level                 |
| 3    | [S8] Conduct regular employee training                                              | A.2.2    | Time to make production schedule               |
|      |                                                                                    | A.1.5    | Finished Goods Inventory Level                 |
| 4    | [S1] Improve good relation with suppliers (Krause et al., 1998)                      | B.1.1    | Supplier fill rates                            |
|      |                                                                                    | B.1.2    | Percentages of Correct Quantity of Order Deliveries |
| 5    | [S6] Reward and Punishment (Gitosudarmo, 2000)                                      | B.1.1    | Supplier fill rates                            |
|      |                                                                                    | A.2.2    | Time to make production schedule               |
|      |                                                                                    | A.1.5    | Finished Goods Inventory Level                 |
| 6    | [S2] Integrated data usage (Immawan T & Nugraha I, 2020)                             | B.1.1    | Supplier fill rates                            |
|      |                                                                                    | B.1.2    | Percentages of Correct Quantity of Order Deliveries |
|      |                                                                                    | A.2.2    | Time to make production schedule               |
| 7    | [S7] Improve communication between divisions that involved in production process    | A.1.5    | Finished Goods Inventory Level                 |
|      | (Wigaringtyas, 2013)                                                                | A.2.2    | Time to make production schedule               |
| 8    | [S4] Understanding Market Conditions to produce accurate forecasting                | A.2.2    | Time to make production schedule               |
| 9    | [S9] Repair damaged machines in the painting process                                 | A.1.5    | Finished Goods Inventory Level                 |
| 10   | [S3] Supplier Outsourcing (Li S et al., 2017)                                        | B.1.1    | Supplier fill rates                            |
|      |                                                                                    | B.1.2    | Percentages of Correct Quantity of Order Deliveries |

From table above, we can see the proposed performance improvement strategies and those that have been ranked according to the rankings of the Prioritization Matrix. In each strategy has been paired
with each indicator associated with the strategy. The indicators have also been sorted based on the magnitude of the Likert scale value on the strategy from the largest number to the smallest number in accordance with calculations on the Prioritization Matrix. Below is a brief description of the top three rankings of the proposed strategy:

1) Employee Job-lists and Employee Job-desc prioritization.

Job-lists and Job-desc prioritization is one of the strategies obtained from discussions with the company. This strategy can answer the problems that exist in the indicator Time to make production schedule with an effectiveness value of nine. The implementation of this strategy on these indicators will be discussed in the section below.

   a. Time to make production schedule (A.2.2).

   Job-lists The problems that occur in this indicator, one of which is a problem with employees, employees who have the responsibility to do this task also have many other tasks, so the process of making a production schedule is often hampered. It often happens that when the employee is making a production schedule, he is asked to do other things. With this strategy, the company can create a Job-list for each employee so that if employees who are tied to making production schedules have a duty to create a production schedule. Other employees or other divisions can find out about this through this Job-List, so that employees cannot be bothered with other tasks. In addition, companies can also make Job-desc prioritization, which is to sort the priority of the Job-lists that have been created so that employees don't get confused about what tasks they should take precedence over the several tasks they are given every day.

2) Changes the production schedule timeline.

Changes the production schedule timeline can answer the problem of two indicators that still have less multiplying performance values, namely the Time to make production schedule indicator and the Finished Goods Inventory Level. This strategy will be analyzed further for each of the indicators below.

   a. Time to make production schedule (A.2.2).

   In accordance with field conditions based on discussions with the company. The timeline for making the production schedule is always done in the middle of the month in one month before the production schedule is used. The production schedule is made when the demand figure is given by the company which is the customer of this company. Usually the demand rate drops on the fifteenth of each month. The production schedule creation process is always targeted to be completed in one day. Because on the following day, the production schedule should have been distributed to other divisions, one of which is to the part control division where they can then use it as a guide to determine the number of parts they order from suppliers. However, due to the fact in the field the production schedule making process always experiences delays and during 2019 it has never been completed in one day, one strategy that companies can do is to change the timeline for making a special production schedule, the deadline for the demand figures for companies that are their customers. The timeline for making a production schedule, which is usually carried out every fifteenth, can be forwarded so that if there is a delay in making the production schedule, this does not interfere with other production processes. Because by making the production schedule earlier, the schedule can also be distributed earlier to other divisions.

   b. Finished Goods Inventory Level (A.1.5).

   With the modified production schedule timeline, this allows other divisions to start production planning better. The delay in making a production schedule can have an effect on ordering parts to suppliers, considering that suppliers have different lead times. This can also affect the production process which in the end can result in the number of production targets not being achieved so that the amount of safety stock is not in accordance with company planning.

3) Conduct regular employee training

Conducting Regular employee training can be a strategy for the company. This strategy is related to the indicator Time to make production schedule and the Finished Goods Inventory Level.

   a. Time to make production schedule (A.2.2).

   Implementation of routine training procurement strategies for employees on this indicator can be done by carrying out training for employees who have the responsibility of making production schedules.
This training can also be given to employees in other PPIC divisions, with the aim that the workload for making this production schedule can be given to other employees if the employee concerned is currently having other important tasks or is unable to do the task.

b. Finished Goods Inventory Level (A.1.5).

The implementation of this strategy can affect the Finished Goods Inventory Level indicator even though the effectiveness value is very small. Not achieving the number of safety stock in the company can be caused by many reasons from this production process itself. One of the causes could be caused by human factors such as work speed, ability to operate machines, and others. This human factor problem can be overcome by conducting routine training for employees so that their performance can be maintained.

4) Improve good relation with suppliers.

This performance improvement strategy has a relationship with two indicators, namely Supplier fill rates and Percentages of Correct Quantity of Order Delivery. These two indicators have a relationship with supplier performance, because the magnitude of the performance value on these two indicators is influenced by supplier performance. Therefore, one of the steps that can be taken is to improve good relations with suppliers.

a. Supplier fill rates (B.1.1).

Companies could also conduct site visits to find out the condition of their suppliers (Razaei et al., 2015). By conducting site visits, companies will have a better understanding of the condition of their suppliers, both conditions in the field and the conditions of the supplier's management. By knowing the conditions of their suppliers, companies can also find out the root of the problem if the parts they have from that supplier experience problems. Companies can also conduct audits, measure supplier performance, certify suppliers, and provide knowledge about continuous improvement to suppliers (Krause et al., 1998). With this, companies can have a basis for making decisions on their suppliers who have poor performance, such as being unable to meet the demand for goods from the company.

b. Percentages of Correct Quantity of Order Deliveries (B.1.2).

In accordance with existing data in the company regarding this indicator, suppliers from the company very often make mistakes in delivery such as errors in the number and errors in the type of parts sent. With a good relationship between the company and suppliers, the company can improve communication with suppliers. And with good communication, information exchange can run well (Rezaei & Ortt, 2013). With good information exchange and mutual disclosure of information between companies and suppliers, this can keep the supply chain process away from miss communication problems such as errors in quantity, schedule errors, errors in the type of goods, and other errors related to communication.

5) Reward and Punishment.

Reward and Punishment by the company aims to spur the enthusiasm of its employees in order to improve their performance at work. In accordance with the opinion expressed by Gitosudarmo and Sudita (2000: 226), one of the basic goals of reward and punishment is to motivate members of the organization. Work motivation for employees is formed by the existence of rewards, derived from salaries, allowances, bonuses, interpersonal awards, and others. Several studies have shown that giving rewards can effectively improve the performance of employees (Mansyur, 2013). However, giving punishment is actually not an effective way for managers to change behavior, because punishment only affects behavior that is temporary and does not last long, Gitosudarmo and Sudita (2000: 226). Punishment can be given if the employee has made a mistake for the number of times, so that the deterrent effect can be felt by the employee not to repeat the problem again. This performance improvement strategy can answer the problem of the three indicators which will be discussed further in the section below.

a. Supplier fill rates (B.1.1).

Reward and punishment can also be applied to suppliers through a predetermined agreement. Given the number of mistakes made by suppliers, they are repeated quite often based on existing data. So to avoid recurring mistakes, companies can implement a strategy of giving rewards and punishments to their suppliers.
b. Time to make production schedule (A.2.2).
This strategy can also be carried out in the PPIC division which has the responsibility for creating production schedules. Due to delays in making production schedules continued throughout the year. To deal with this, companies can use a strategy of giving punishment if this happens repeatedly. However, if the employee can complete the production schedule according to the company’s target in one day, then the employee deserves a reward in any form in order to motivate the employee to maintain his performance.

c. Finished Goods Inventory Level (A.1.5).
The finish of a good inventory level can be caused by many things, one of which is the problem of not achieving the number of production targets. This strategy can be applied to employees in the production division, if they can achieve production targets, then they will get rewards to motivate them to carry out work. Not only for the production division, this strategy can also be applied to the PPIC division considering that all production planning is carried out by the division.

6) Integrated data usage.
The use of integrated data such as ERP will have a very good impact on the company. Considering that companies have not used integrated data, they are still exchanging data information manually, namely by email. By applying this strategy, the company can improve the performance of the three indicators that are still not performing well which will be discussed in the section below.

a. Supplier fill rates (B.1.1).
The use of integrated data on suppliers can be implemented by the company. Companies can integrate data on suppliers through licensing from these suppliers, from this data the company can find out the conditions of the suppliers, how many they send, what parts they send, so that errors that occur can be found quickly without having to wait for the goods to be sent supplier to the company. If the data from the supplier shows that they sent parts in an amount that does not match the company's request, then the company will be able to take action in a short time, so that it can overcome problems in the field regarding part shortages. It is also through the collected data that companies can determine their decisions on their suppliers (Immawan T & Nugraha I, 2020). If the data shows that the supplier often sends an amount that is not in accordance with the request, the company can evaluate the supplier. Management can also adjust the number of orders for their company to an amount that matches the actual capacity of the supplier based on this data.

b. Percentages of Correct Quantity of Order Deliveries (B.1.2).
Just like the previous indicators, this strategy can be done by integrating data on their suppliers. From this data, the company can find out the condition of the supplier, how much they send, what parts they send, so that any errors that occur can be found quickly without having to wait for the goods sent by the supplier to the company. Although suppliers can cover up their mistakes by resending the wrong parts, these errors can impact other supply chain processes such as part control and production processes. Therefore, the company must have good strategic step to cover the problems of this indicator.

c. Time to make production schedule (A.2.2).
The process of making a production schedule is done after the company gets the demand figures from the companies that are their customers. After the production schedule is completed, the production schedule is closed first so that it can be fixed. The process of sending data from companies that are their customers is still through manual means, namely sending email. By using integrated data between the company and other companies that are their customers. Companies can shorten the process of making a production schedule which is the problem of these indicators. In addition, parties from companies that are their customers also often revise the number of demands which hampers the production schedule creation process. Considering that making a production schedule must adjust to actual conditions in the field, with the implementation of integrated data, this will help the PPIC division to find out the condition of the company through the integrated data.

7) Improve communication between divisions that involved in production process.
Improving communication between divisions is defined as a condition in which between divisions must know each other about their field conditions and what they are doing, through this strategy the company can reduce problems in the field such as miss communication and differences of opinion.
(Wigaringtyas, 2013). This strategy can be done by holding regular meetings between division heads, using integrated data, and also creating job lists. This strategy can answer problems that exist in problematic company performance indicators which will be discussed in the section below.

a. Finished Goods Inventory Level (A.1.5).
The process of making a production schedule must consider conditions in the field. For example, if the production division is experiencing engine failure, the production schedule must be adjusted to the latest production capacity and if that month there is a machine repair schedule, the production schedule must also be adjusted. Therefore, this strategy needs to be applied in order to improve the performance of this indicator.

b. Time to make production schedule (A.2.2).
The process of making a production schedule requires adjustments to company conditions in the field. One of the things that causes delays in the production schedule process is waiting for the meeting schedule to agree on the results of the production schedule. With the routine meetings held by the company, the PPIC division as the person in charge of making production schedules can find out the conditions from the field periodically. By knowing the condition of the company, the PPIC division can quickly decide the results of the production schedule.

8) Understanding Market Conditions to produce accurate forecasting.
This strategy is related to the forecasting process which will later be related to the Time to make production schedule indicator. Because the process of making a production schedule at this company is carried out waiting for the results of the forecast.

a. Time to make production schedule (A.2.2).
One of the problems with this indicator is the number of revisions to the number of requests. Meanwhile, the process of making a production schedule is carried out after a decreasing number of requests from customer companies. With the improvement of this performance improvement strategy, it is hoped that the process of determining demand can be determined precisely without many revisions, which can affect the production schedule creation process.

9) Repair damaged machines in the painting process.
Repairing machines is one possible strategy even though it requires a large investment. The machine referred to in this strategy is a machine in the painting Sub-Assembly division. The painting process is carried out using an automatic machine which is quite old at this time. According to discussions with the company, the performance of this machine is based on cycle time, has not performed well compared to new machines. If this strategy is implemented, this strategy can help improve the performance of the Finished Goods Inventory Level indicator which does not reach the company's target.

a. Finished Goods Inventory Level (A.1.5).
The problem with this indicator is the amount of safety stock that does not reach the company's target. By using a new machine, the cycle time of the production process will be faster. With a shorter production time, in one month the company can produce a larger number of products. So, companies can achieve the targets of their production and meet the amount of safety stock they plan.

10) Supplier Outsourcing.
Supplier Outsourcing is a strategy that can be carried out by company suppliers. This strategy has the smallest ranking, because Supplier Outsourcing is a strategy that can be carried out if the supplier's condition is really bad. What is meant by Supplier Outsourcing is a strategy whereby suppliers can outsource in fulfilling requests from the company. Based on research conducted by Li et al. (2017), suppliers who outsource will have better performance in meeting the demands of the company. This strategy will have a good impact on Supplier fill rates and Percentages of Correct Quantity of Order Deliveries indicators.

a. Supplier fill rates (B.1.1).
By implementing the Supplier Outsourcing strategy, suppliers from the company will be able to meet the demands of the company because their production power will also increase with this strategy. Also the problems from suppliers regarding meeting demand will be resolved.

b. Percentages of Correct Quantity of Order Deliveries (B.1.2).
The impact of the Supplier Outsourcing strategy on this indicator is not far from the Supplier fill rates indicator. By using an outsourcing strategy, suppliers will have better performance in meeting the demands of the company. Then the number of requests from the company should be fulfilled properly.

5. Conclusion
This study aims to obtain the value of the company's supply chain performance to determine the supply chain performance improvement strategy of PT. X so that the performance of the company's supply chain can improve. Following are the conclusions of this study:

1. From the Model Supply Chain Operation Reference (SCOR) method. 46 indicators can be used to measure supply chain performance in automotive manufacturing companies. After the validation process, 29 valid indicators were obtained for use and 17 invalid indicators were adjusted to the needs of the company.

2. From the results of the measurement of supply chain performance in this study, the average value of company supply chain performance in 2019 is 82.14% which is included in the “good” category.

3. Based on the results of the mapping of indicators using the Importance and Performance Analysis (IPA) method, there are five performance indicators that have poor performance values but are considered important by the company. Those indicators are Finished Goods Inventory Level (A.1.5), Time to make production schedule (A.2.2), Supplier fill rates (B.1.1), Percentages of Correct Quantity of Order Deliveries (B.1.2), and Labor costs (C.4.1). Those strategies have identified the root cause of the problems, and together with company representatives. The suitable strategies have been determined to improve the performance of those indicators.

4. There are ten proposed improvement strategies to be used as strategy to improve performance of the company. By using the Prioritization Matrix tool, the ten strategies are sorted by effectiveness and difficulty level to implemented. Based on company’s representative. Strategy that was thought to be the easiest strategies to implement but have an impact to the company was making employee Job-lists and Job-desc prioritization to avoid delays in making production schedules. The second strategy was changes the production schedule timeline, that would affect time to make production schedule and also affect finish goods inventory planning. For the third easiest strategies to implement but have an impact to the company was conducting regular employee training to ensure the employees quality in running the company’s business.

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