Analysis of Business Process at PT XYZ by Using SCOR Thread Diagram

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Abstract. Supply Chain Operations Reference (SCOR) is a standard supply chain performance evaluation model which is proposed by Supply Chain Council (SCC). SCOR makes companies can analyse and evaluate their supply chain performance. SCOR has Thread Diagram which describes business process simply and systematically to help the analysis of company’s business process. This research takes place in PT XYZ that is involved in Crude Palm Oil (CPO) industry. PT XYZ used to be the market leader of CPO industry but nowadays they have a trouble to compete with new competitors. The purpose of this study is to provide the input for PT XYZ business process improvement to enhance the competitiveness of the company with the others. The result obtained shows that there are two performance metrics that are not reached. The analysis of business process shows the lack of control role of PT XYZ to supplier and customer side which is going to be the suggestion of improvement.

1. Introduction
Companies must compete to survive. As an impact of global economic growth, companies are not only competing with similar companies, but also other companies in their supply chain system[1]. PT XYZ is a company engaged in the production of crude palm oil (CPO). Nowadays the company has to face the higher competition because the companies which were previously customers of PT XYZ have developed their business to upstream which means they also produce CPO themselves.

PT XYZ had difficulty in the competition due to bottlenecks in business processes. The business processes that exist today unable the company to control the supply of raw materials and product delivery. The lack of control makes the business process of PT XYZ does not meet the requirement to be categorized as good business process because the absence of embeddedness[2]. This is the reason of improvements necessity in PT XYZ business processes. The purpose of this study is to provide the input for PT XYZ business process improvement to enhance the competitiveness of the company with the others.

Business process can be defined as a set of tasks which are logically related performed to achieve a defined business output[3]. Business process improvement is a radical rethinking and changes in business processes to produce a dramatic increase in performance measurement[4]. Pittiglio Rabin Todd & McGrath and Advanced Manufacturing Research joined to form a supply chain council (SCC) with more than 65 other companies in 1996. They introduced a model of supply chain operations reference (SCOR) to help companies carry out a systematic analysis. The goal is to determine the basic business rules to establish the supply chain[5].

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This study uses SCOR Thread Diagram as tool to analyse existing business process to gain the possible actions of improving business process performance. Measurement result shows that there are two performance metrics which does not meet the target. SCOR Thread Diagram indicates the need of improving control role in PT XYZ business process.

2. Research methods
The object of research observed is PT XYZ business processes. Operational variable used are:

- Reliability, consists of delivery performance and perfect order fulfillment metric performances. Delivery performance is the comparison between the quantity of order received and order delivered. Meanwhile perfect order fulfillment is the comparison between the perfect order (there is no return from customer) and order delivered.
- Responsiveness, consists of order fulfillment lead time metric performance. Order fulfillment lead time is the time counted from the order received by company until the order delivered.
- Flexibility, consists of production flexibility metric performance. Production flexibility is the ability of the company to fulfill the increase of order by 20% suddenly.
- Cost, consists of warranty / returns processing cost metric performance. Warranty cost is the percentage of the cost for warranty to the total cost of production.
- Asset Management Efficiency, consists of inventory days of supply metric performance. Inventory days of supply is the ability of inventory to fulfill order by days[6].

Business process improvement cycle can be seen in figure 1:

![Business process improvement cycle](image.png)

3. Result and discussion

3.1. Business process performance measurement
To measure the performance of current business processes, we use the SCOR model. SCOR is a reference model of supply chain operations. SCOR is also essentially a model based on processes. The model integrates three main elements in the management that are business process reengineering, benchmarking, and process measurement into a cross-functional framework in the supply chain[8].

The results of performance measurement with SCOR can be seen in table 1.
3.2. Performance comparison

The current company's performance then is compared to best in class of SCC and the target of company which can be seen in table 2.

Table 2. Comparison of performance

| Metric                  | Best in Class | Target of Company | Current Average |
|-------------------------|---------------|-------------------|-----------------|
| Delivery performance    | 93%           | 90%               | 100%            |
| Perfect order fulfillment| 92.4%         | 80%               | 100%            |
| Order fulfillment lead time | 135 days     | 20 days           | 15.22 days      |
| Production flexibility  | -             | -                 | -               |
| Warranty cost as% of revenue | 1.2%       | 1%                | 0%              |
| Inventory days of supply| 55 days       | 4 days            | 4.02 days       |

From the table above it can be seen that there are two metrics that have not reached the target yet. So it is necessary for the improvement of business processes.

3.3. Business process improvement

3.3.1. Current business process

To make the improvement, at first the existing business processes in the company described by the SCOR thread diagram which can be seen in figure 2.
In the picture above it can be seen that the processes undertaken by the supplier are producing the raw material (M1), accepting returns of raw materials (DR1) and planning the delivery (P4). The supplier then contacts the transportation service to follow the delivery plan which has been created (D1). While the business processes that occur at PT XYZ are planning company's supply chain (P1), planning raw material requirements (P2), planing production (P3), plotting the return of raw materials (P5), receiving raw material (S1), performing production activities (M1) and returning the raw materials (SR1). While customer planning raw material (P2), receiving raw materials (S2) and planning delivery (P4) that connects to the delivery (D1).

3.3.2. Proposed business process
From the current business processes it can be seen that the PT XYZ is not able to control the supply chain both upstream and downstream. In the upstream, PT XYZ do not have control because the raw materials are only sent by the supplier without any communication with PT XYZ. Suppliers also undertake the production of raw materials without any specific planning with production planning of PT XYZ.

In the downstream, it appears that the product delivery is planned by the customer without any communication to the PT XYZ. This makes the company has difficulties in making production planning and control as well as inventory. These cause PT XYZ difficulty in competing today.

The proposed changes to PT XYZ business processes shown in figure 3.
Figure 3 above shows that it is proposed that the planning of raw material production (P3) at supplier must be controlled by source planning (P2) at PT XYZ which is linked by delivery planning (P4) at supplier. The other proposal is moving the delivery planning (P4) from customer to PT XYZ and integrating the delivery planning (P4) at PT XYZ with source planning (P2) at customer in delivery process (D1).

4. Conclusion
The conclusion of this study is PT XYZ experiencing difficulties in competing with other companies. The previous study shows that SCOR is useful in designing business process at oil industry[9]. The results of business performance measurement using SCOR indicating two metrics that have not reached the target. This is the impact of the company's business processes that lead to a lack of control to upstream and downstream. The proposed changes to the enterprise business process analysis and improvement are illustrated in SCOR Thread Diagram that increase the control of PT XYZ in supply chain system and reintegrate the supply chain to minimize the bottleneck.

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