A SCOR-based Performance Measurement of Indonesia's Kayumas Specialty Coffe Supply Chain

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ABSTRACT

Performance evaluation is essential in defining supply chain strategies because by taking measurements, companies can find out how the business processes in the supply chain are running and formulate strategic policies to improve supply chain performance. Specialty coffee is a premium coffee with a unique aroma and flavour originating from a specific region, and it is easy to trace its origin from the farm to the consumer. This study aims to evaluate the performance of the Kayumas specialty coffee supply chain using the SCOR-ANP method and determine performance improvement strategies using ANP analysis. The research results can be concluded that (1) Kayumas specialty coffee supply chain consists of farmers, farmer groups, distributors/resellers, and consumers. (2) The performance position of Kayumas specialty coffee is inferior (3) The performance improvement strategy needed to improve product quality is a partnership between supply chain members to reach a price agreement.

Keywords: specialty coffee, kayumas coffe, supply chain performance, performance measurement, SCOR

INTRODUCTION

Indonesia is a coffee-producing country with the most specialty coffee types in the world [1]. Indonesia's well-known specialty coffees include Gayo coffee, Toraja coffee, Java coffee and Mandheling coffee. Specialty coffee is a premium coffee with a unique aroma and flavour, originating from a region (origin), and it is easy to trace its origin from the garden to the consumer's hand [2]. The attributes of specialty coffee that distinguish it from regular coffee are flavour, aroma, cupping score, physical appearance, size/grade, origin, certification, farm origin, and brand [3].

Kayumas coffee is a specialty coffee from Java, precisely from Kayumas Village, Arjasa District, Situbondo Regency, East Java. The characteristics of Kayumas coffee are fruity, floral flavours, and a slight aroma of chocolate; number of defects is less than 3%, and certified organic SNI 6729: 2016: Organic Farming System and SNI 01-2907:2008: Coffee Beans. Kayumas Coffee is also included in the Geographical Indication (GI) of Arabica Java-Ijen Raung Coffee, which explains the origin of the coffee, which is an original Indonesian product and comes from the cultivation area of Mount Ijen and Raung.

Lack of industrialization, inadequate management, information inaccuracies, and inefficient supply chains are significant problems in agribusiness supply chains [4]. The competitiveness of Indonesian coffee products is lower than that of other countries despite having diverse types of specialty coffee. Several factors affect the quality of Indonesian coffee, including low productivity and high production costs. Indonesian coffee plantations are mostly smallholder plantations, so traditional cultivation and processing

are factors affecting the quality of coffee products [5]. Therefore, effective and efficient management is needed to achieve good company performance. The supply chain can improve company performance by managing quality, suitability, sensitivity to change, and cost efficiency [6].

Supply chain performance is a set of measures used to measure the efficiency and effectiveness of the processes and relationships in the supply chain that include various functions and companies so that the supply chain can run. Performance measurement is essential in the formulation of a supply chain strategy. Performance measurement provides information about parts of the supply chain that need improvement, helps identify problems, and is a reference for focusing performance improvement efforts [7]. The Supply Chain Operation Reference (SCOR) model approach is one method of measuring supply chain performance. The SCOR model has been developed to describe the business activities associated with all phases of fulfilling customer demand and is organized based on six main management processes: Plan, Source, Make, Deliver, Return, and Enable [8].

Improving supply chain performance is done by formulating strategies under the conditions of the supply chain. The strategy must lead to the long-term goal of creating cheap, quality products delivered on time and the supply chain must have the ability to operate efficiently [9]. This study aims to evaluate the performance of the Kayumas coffee supply chain based on the Supply Chain Operation Reference (SCOR) model to see the position of supply chain performance and determine strategies for improving supply chain performance based on performance measurement results.

RESEARCH METHOD

The research consisted of supply chain configuration analysis, performance measurement and determining supply chain improvement strategy. Then, the supply chain performance measurement was carried out on the internal supply chain section at the Sejahtera Farmers Group as a producer and processor of Kayumas coffee. The sampling method used purposive sampling. Respondents were selected based on specific criteria following the research topic. Respondents are parties involved in the supply chain (stakeholders), consisting of farmer groups, distributors, consumers, and experts who understand the Kayumas coffee supply chain, including related agencies, coffee practitioners in Situbondo and academics. The data collection method used interviews, questionnaires, and a literature study of relevant documents. The data used were qualitative in the form of supply chain structure and activities and quantitative data in the form of harvest data, production data, and sales data.

Descriptive analysis was conducted by interviewing stakeholders regarding the supply chain structure, goods/materials flow, money/financial flow, and information flow, which were then organized into a scheme. Performance measurement was based on level-1 performance metrics in the Supply Chain Operations Reference (SCOR) model version 11.0. Performance indicators are compiled based on the Reliability, Responsiveness, Agility, Cost, and Asset Management performance attributes described below:

1. Perfect order fulfilment (POF) is the percentage of orders delivered on time, in the right amount ordered, and in perfect condition.
2. Order fulfilment cycle time (OFCT) is the time to fulfil one customer order from when the company receives the order until the order reaches the customer (days).
3. Flexibility is the time needed to fulfil customer orders when there is a change in the quantity of goods ordered, calculated from the time the company receives a change in the order until the order reaches the customer (days).
4. Total supply chain management cost (TSCMC) is the percentage of total supply chain operating costs to overall supply chain revenue.
5. Cost of goods sold (COGS) is the percentage of the total cost to produce products to total supply

chain revenue.

6. Cash-to-cash cycle time (CTCCT) is the time it takes for a company to receive payment from consumers and pay suppliers (days).

Furthermore, each performance indicator's weight value is calculated using the Analysis Network Process (ANP) method. The first ANP analysis stage determines the decision-making model consisting of goal clusters, criteria clusters, sub-criteria clusters, and alternative clusters. The criteria cluster contains elements of the core process (Plan, Source, Make, Deliver, and Return), the sub-criteria cluster is an element of performance attributes (Reliability, Responsiveness, Agility, Cost, and Asset Management), and the alternative cluster contains elements of performance indicators. Then, the calculation of pairwise comparisons of elements in the cluster against elements in other clusters (outer-dependence), as well as comparisons between elements in the same cluster (inner-dependence). The importance value of the elements with values of 1, 3, 5, 7, and 9 is called the Saaty Interest Rate— furthermore, a synthesis to determine the weight of each performance indicator.

The overall performance value is calculated by summing the performance index value of each performance indicator. The performance index is calculated by multiplying the actual value of the performance measurement results and the weight value of the performance measurement. The results of the performance index calculation are then compared with the supply chain performance standards (benchmarking). The standard value of supply chain performance consists of :

1. Excellent performance, if the performance value is between 95% – 100%,
2. Good performance, if the performance value is between 90% – 94%,
3. Medium performance, if the performance value is between 80% – 89%,
4. Inferior performance, if the performance value is between 70% – 79%,
5. Very inferior performance, if the performance value is between 60% – 69%, and
6. Poor performance, if the performance value is below 60%.

The benchmark value is determined by internal benchmarking, namely by measuring the average value of the process performance. However, if the company does not have enough data, then benchmarking is done by external benchmarking based on various references [10].

RESULT AND DISCUSSION

The Kayumas coffee supply chain comprises farmers, farmer groups, distributors/resellers, and consumers. Coffee cultivation is carried out with an organic cultivation system certified by the National Accreditation Committee (KAN) in 2018. The resulting product is coffee cherries, then sold to farmer groups. The farmer group acts as a processing unit for coffee cultivated by farmers. Post-harvest coffee processing is traditionally carried out with full-washed, natural, and anaerobic processes. The product produced from the process in the farmer group is coffee beans (green beans). The coffee beans are stored in the farmer group's warehouse and distributed to distributors. Distributors consist of repacking distributors (resellers) and roastery. Repacking distributors buy coffee beans in bulk, then repackage them into smaller packages and sell them. Roastery further processes coffee beans into roasted or ground coffee, then sold to consumers. Apart from distributors, the sale of coffee beans is also done directly by farmer groups to consumers.

Supply Chain Performance

Kayumas' coffee supply chain performance measurement is based on the performance attributes of reliability, responsiveness, agility, cost, and asset management. Performance metric indicators represent each of these performance attributes.

Table 1. Kayumas Coffee Supply Chain Performance Measurement Result

Attributes	Indicators	Actual value (%)	Weight	Performance index (%)
Reliability	Perfect order fulfillment	96,43	0,24	22,68
Responsiveness	Order fulfillment cycle time	77,08	0,20	15,86
Agility	Flexibility	77,08	0,21	16,54
Cost	TSCMC	81,25	0,14	11,13
	Cost of goods sold	41,99	0,10	4,41
Asset management	Cash-to-cash cycle time	100,00	0,09	9,81
Performance value				80.42
Category				Medium

Based on Table 1, the performance measurement results are as follows: The perfect order fulfillment (POF) indicator has an actual value of 96.43% with a performance index of 22.68%. The order fulfillment cycle time (OFCT) indicator has an actual value of 77.08% with a performance index of 15.86%. The Flexibility indicator has a performance index of 77.08%, with an actual value of 16.54%. The Total supply chain management cost (TSCMC) indicator has a performance index of 11.13%, with an actual value of 81.25%. The Cost of goods sold (COGS) metric has an actual value of 41.99%, with a performance index of 4.41%. The Cash-to-cash cycle time metric has an actual value of 100%, with a performance index of 9.81%.

Perfect Order Fulfillment (POF) is a performance indicator that explains the company's ability to fulfil orders perfectly against all orders sent by the company. The perfect order criteria referred to in the perfect order fulfilment indicator are orders delivered on time, with the right amount, have perfect conditions and do not experience shipping damage. The company has been able to meet consumer demand well, which states that to achieve good delivery performance. Companies must meet the criteria of time, quantity, quality, and documentation to achieve good delivery performance [11].

Order fulfilment cycle time (OFCT) is the average cycle time to fulfil customer orders. The calculation of order fulfilment time starts by calculating the cycle time to find products in the warehouse (Source cycle time), then the process of packaging goods (Make cycle time), and the time the product is ready to be sent until the product is received by consumers (Deliver cycle time). The average delivery time after an order is received is five days. The shorter the OFCT duration, the better the supply chain performance. Consumers expect the waiting time to get goods faster, ranging from 1-2 days [12].

Supply chain measurement flexibility is the time companies need to fulfil order changes. The time to respond to changes is calculated when orders come in, and then the company looks for goods in the warehouse and packs the goods. The company carries out production once a year. The products stored are in the form of rice coffee beans or green beans, which are ready to be sold. The company stores goods in the form of finished products so that when there is a change in orders by consumers, the company can immediately fulfil orders. Flexibility is a driver to achieve high agility value, along with internal and external integration that positively influences supply chain performance [13].

Total supply chain management cost (TSCMC) is an indicator of the efficient use of costs for supply chain operations, consisting of crop maintenance, production operations, and shipping costs. Production costs in the Kayumas coffee supply chain are not calculated in the TSCMS metric because they will be calculated in the COGS metric. The cost that has the highest portion in the TSCMC indicator is the production operational cost, which includes routine labor costs and routine operational costs. Cost of goods sold (COGS) indicates the efficiency of costs used to make a product. The COGS calculation consists of the cost

of purchasing raw materials, labor costs, and indirect costs. The cost of purchasing raw materials is the aspect that most affects the value of COGS. The efficiency of using costs in the supply chain is good enough. However, some aspects need to be improved, especially in resource aspects such as labor and raw materials. The low value of the Cost attribute indicates that the supply chain is not running efficiently [14]. The efficient use of material resources can be achieved with solid integration between stakeholders in the supply chain [15].

Cash-to-cash cycle time (CTCCT) is the time required for investments to procure raw materials to return to the company. CTCCT calculation consists of calculating the range of payments from consumers and the range of payments to suppliers. The actual value of CTCCT performance is two days and is in a Superior position. The payment system in the Kayumas coffee supply chain uses a direct payment system, either in cash or by bank transfer. The purchase of raw materials is paid for when farmers deliver raw cherry coffee materials to the farmer group. Payment from consumers is given when the order is made, and the order will be sent when the consumer has paid in full. This payment system causes the company to have no debt to suppliers or receivables to consumers; the value of CTCCT is low. The research shows that the lower the CTCCT time, the better the supply chain performance [16].

CONCLUSION

The overall result of the analysis showed that the supply chain performance of Kayumas specialty coffee is under category of Poor performance. The overall performance index of 71.29% indicates that the supply chain is not functioning well. Indicators that need to be improved are order fulfilment cycle time and flexibility. Responsiveness and agility of supply chain performance rely a lot on cargo delivery.

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