

SUPPLY CHAIN PERFORMANCE AND SUPPLY CHAIN COST IN PERISHABLE PRODUCT IN THAILAND

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ABSTRACT

This research presents a quantitative data analysis of the complete set of results from supply chain performance measurement and supply chain cost. The purpose of meta analysis is to identify trends and provide an overview of all data collected. The analysis of trends is reliable when a large sample of collected data is used. The meta analysis also examines the relation between all parameters within the supply chain performance measurement using SCOR model. An overview of the effect on collaboration and performance of a number of factors are taken from the CFPLR model. The meta analysis covers identifying costs of orchid supply chain that are operating costs associated with business functions related to the procurement, manufacturing and distribution of orchids. Finally, the inter-correlations of supply chain performance and supply chain cost are also examined.

Keywords—Logistics Performance, Orchid, Supply Chain Cost

INTRODUCTION

The quantitative meta analysis was aimed at conducting a further investigation of how collaboration among orchids vendors will be made by the use of supply chain performance measurement. Supply chain performance measures can be classified broadly into two categories: qualitative measures (such as customer satisfaction and product quality) and quantitative measures (such as order-to-delivery lead time, supply chain response time, flexibility, resource utilization, delivery performance, etc.). This study considers only the quantitative performance measures in which the measurement was developed using SCOR model. It was used to identify, measure, reorganize and improve the orchids supply chain processes. Improving supply chain performance may require a multi-dimensional strategy that addresses how the organization will service diverse customer needs. The inter-correlations of supply chain performance and supply chain cost are examined. These can be used to identify the correlation among different parameters, and correlations within supply chain performance measurements objectively and subjectively. This may also provide information regarding which technique is most or least functional as a measure of supply chain collaboration. The meta analysis here presents a cross examination of both measurements to allow statistical and descriptive comparison. The trend of data that is wider spread can be more identifiable, and this data is less likely to be biased by anomalies.

LITERATURE REVIEW

1. SCOR

SCOR version 5.0 includes a series of enable elements for each of the processes. Enable elements focus on information policy and relationships to enable the planning and execution of supply chain activities. SCOR spans all customer, product, and market interactions surrounding sales orders, purchase orders, work orders, return authorizations, forecasts, and replenishment orders. It also encompasses material movements of raw material, work-in-process, finished goods, and return goods. In version 5.0, SCOR specifically does not address

sales processes, product development, and customer relationship management processes. The SCOR model includes three levels of process detail. In practice, Level One defines the number of supply chains and how their performance is measured. Level Two defines the configuration of planning and execution processes in material flow, using standard categories like stock, to-order, and engineer-to order. Level Three defines the business process used to transact sales orders, purchase orders, work orders, return authorizations, replenishment orders, and forecasts.

2. Supply Chain Performance

This measurement identifies five core supply chain performance attributes: Reliability, Responsiveness, Agility, Costs, and Assets. They are shown as follows (Hotrawaisaya, 2014):

2.1 Reliability

The Reliability attribute addresses the ability to perform tasks as expected. Reliability focuses on the predictability of the outcome of a process. Typical metrics for the reliability attribute include: on-time, the right quantity, the right quality. The SCOR's KPI (level 1 metric) is Perfect Order Fulfillment. Reliability is a customer-focused attribute.

2.2 Responsiveness

The Responsiveness attribute describes the speed at which tasks are performed. Examples include cycle time metrics. The SCOR's KPI is Order Fulfillment Cycle Time. Responsiveness is a customer-focused attribute.

2.3 Agility

The Agility attribute describes the ability to respond to external influences and the ability to change. External influences include: Non-forecasted increases or decreases in demand; suppliers or partners going out of business; natural disasters; acts of (cyber) terrorism; availability of financial tools (the economy); or labor issues. The SCOR's KPIs include Flexibility and Adaptability. Agility is a customer-focused attribute.

2.4 Cost

The Cost attribute describes the cost of operating the process. It includes labor costs, material costs, and transportation costs. The SCOR's KPIs include Cost of Goods Sold and Supply Chain Management Cost. These two indicators cover all supply chain spend. Cost is an internally focused attribute.

2.5 Asset

The Asset Management Efficiency ("Assets") attribute describes the ability to efficiently utilize assets. Asset management strategies in a supply chain include inventory reduction and insourcing versus outsourcing. Metrics include: inventory days of supply and capacity utilization. The SCOR's KPIs include: Cash-to-Cash Cycle Time and Return on Fixed Assets. Asset Management Efficiency is an internally-focused attribute.

3. Supply Chain Cost

Supply chain cost is a discrete measure defined as the fixed and operational costs associated with the supply chain processes linking from upstream to downstream. A view of supply chain costs takes into account:

3.1 Order Management Cost (Customer Service, Finished Goods Warehouse, Outbound Transportation, Contract and Program Management, Installation Planning and Execution, Accounts Receivable)

3.2 Material Acquisition Cost (Purchasing, Raw Material Warehouse, Supplier Quality, Component Engineering and Tooling, Inbound Transportation)

3.3 Planning Cost (Demand Planning, Supply Planning, Supply Chain Finance)

3.4 Inventory Carrying Cost (Opportunity, Obsolescence, Shrinkage, Taxes and Insurance)

3.5 IT Cost for Supply Chain (Supply Chain Application, IT Operation for Supply Chain)

DISCUSSION

The present analysis of the impact of supply chain performance was made towards all vendors in orchids supply chain. For reliability, an average score of Plan, Source, Make, and Deliver was between 3 and 4 of Likert Scale. This means normally all vendors did not fulfill a performance level as best practices, and that should be an efficient improvement. For responsiveness, data was collected as quantitative analysis. It should be noted that time to adjust delivery plan in case of order processing changes, time to release until receive an order from suppliers, duration of raw materials procurement from new sources, and time to deliver products in domestic was only 1 day. Nonetheless, time to deliver products in overseas was nearly 3 days. Data was also quantitatively collected for agility. Time to adjust an order processing plan in case of changed quantity requirements, time to adjust an order processing plan in case of changed delivery time, time to release an order in case of an urgent requirement, and time to deliver products in domestic was also 1 day. Delivering orchids requires speed to reduce decomposition of orchids because its short life cycle. Moreover, a policy in returning defective products by suppliers (from producers) and returning defective raw materials by producers (from customers) was approximately 3 days. For the cost perspective, supply chain management cost equals to 940,000 Baht, cost of goods sold equals to 450,000 Baht, value-added productivity equals to 50,000 Baht, and warranty cost or returns processing cost equals to 30,000 Baht. Similarly, the asset utilization was analyzed and summarized as follows: payment made to suppliers until receiving money from customers equals to 180,000 Baht, cut-flower orchids equals to 40 %, and flask orchids equals to 60 %. Delivering orchids was done by means of truck, truck connecting with train, truck connecting with airplane of 100%, 0%, and 50%, respectively. The cost of transportation per number equals to 2,500 Baht.

Supply chain cost analysis indicated and summarized that order management cost equals to 40.17%, material acquisition cost equals to 47.234%, planning cost equals to 2.234%, inventory carrying cost equals to 9.52%, and IT cost for supply chain equals to 5.283%. This supply chain cost was calculation on a monthly basis as the fixed and operational costs associated with the supply chain processes linking from upstream to downstream. The quantitative meta analysis experimental programme has been shown to validate supply chain collaboration and a correlation of supply chain performance parameters. The meta analysis was proved to be an acceptable and useful approach, where controlled manipulation of independent variables was applied. The analysis showed a significant correlation of supply chain performance data integration, resulting in a more reliable examination of data trends. It was concluded that there were some correlations between supply chain performance and cost.

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