

# Operating Strategies for a Segmented Supply Chain

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Topic Area: Demand, Sourcing, and Distribution Strategies

## Summary

This research focused on formulating optimal supply chain operating strategies for demand, sourcing, and distribution by replenishment stream for a fast-moving consumer goods company. A replenishment stream is how demand from an external customer flows into the sponsor company's supply chain. This study concludes that there is no one size fits all demand, sourcing, and distribution strategy in consideration of the different replenishment streams. Therefore, strategies need to be crafted according to the data.



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## Introduction

An operations strategy is a method or plan of action that corporations employ to reach their goals. A good strategy enables a company to operate efficiently and use its resources effectively. The purpose of this capstone project is to formulate optimal supply chain operating strategies for demand, sourcing, and distribution by replenishment stream for a fast-moving consumer goods company. A replenishment stream is how demand from an external customer flows into the sponsor company's supply chain. The sponsor company has identified four replenishment streams; base demand, promotions, new initiatives and incremental business activities. It seeks to confirm whether there is a benefit in differentiating the supply

### KEY INSIGHTS

1. The more positively correlated demand is, the less beneficial it is to pool.
2. One size does not fit all when it comes to operating strategies. Therefore, strategies should be curated for a company according to its data, resources, and capabilities.

chain by the four identified streams or some hybrid. Research conducted for this project reveals that there is no one size fits all demand, sourcing, and distribution strategy in consideration of the different replenishment streams. In addition, through a variety of methods including segmentation, calculation of the coefficient of variation, time series analysis, and the generation of forecasts, I conclude that in certain instances there is a benefit to differentiating the supply chain by the 4 identified replenishment streams and in other cases it is advantageous to consolidate them by some hybrid.

The below summarizes the demand, distribution, and sourcing strategies formulated for the sponsor company in accordance with an in-depth analysis of its shipment data, interviews with key staff, and an exhaustive literature review.

### Demand

The sponsor company has the option to pool or not pool the streams depending on

whether the streams are negatively or positively correlated. The more positively correlated the streams are, the less beneficial it is to pool since there is no decrease in uncertainty or variability. Figure 1 depicts when demand should be pooled.

If the replenishment streams do not exhibit a strong positive correlation, then I recommend consolidating demand by the optimal hybrid of streams identified as base demand, promotional, and incremental business activity streams through correlation of coefficient calculations. Aggregating demand by this identified optimal hybrid of streams will lead to improved forecast accuracy and therefore lower safety stock since demand will be stabilized. Lower safety stock means lower average inventory on hand. Pooling demand and therefore reducing uncertainty will enable the sponsor company to reduce inventory without negatively affecting customer service level or product availability. Additionally, by consolidating the

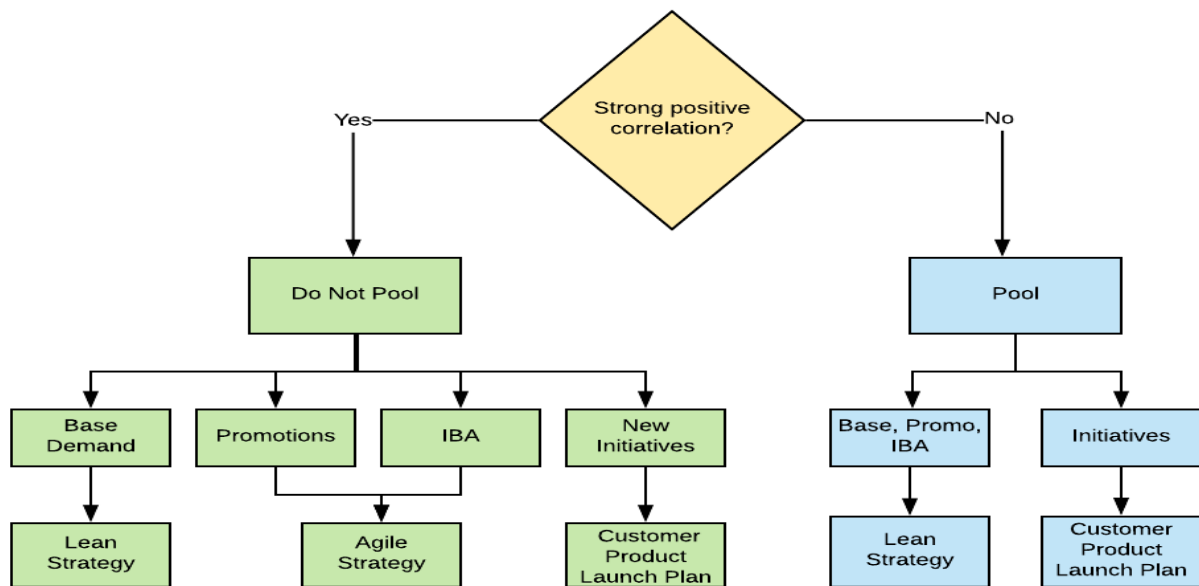


Figure 1: Pooling Decision Tree

streams the sponsor company can streamline operations and eliminate the administrative costs that would result from managing each stream separately. Based on this, adopting a lean strategy would be best if differentiating the supply chain by the identified optimal hybrid of streams.

If the supply chain was to be differentiated by the four streams and each stream was treated individually due to a strong positive correlation, then it would be beneficial for the sponsor company to adopt a lean strategy for the base demand stream since demand under this profile is stable. I recommend an agile strategy for the for the IBA and promotional streams. Implementing collaborative planning, forecasting, and replenishment (CPFR) between the sponsor company and its retailers for the promotional and the IBA streams would provide a high degree of agility. It will also lead to a decrease in safety stock and average inventory as it provides an effective way to anticipate customer demand. CPFR would allow the sponsor company and retailers to collaborate in the management of inventory through sharing information in the quest to meet the needs of the end customer.

### **1.1.1 Distribution**

For the distribution strategy, I recommend that the sponsor company separates the 4 replenishment streams into three buckets. The first bucket is the base demand stream as it is characterized by a steady flow and therefore would benefit from a lean distribution strategy. The second bucket contains the new initiatives stream under an agile distribution strategy. The third bucket pools the promotions and the incremental business activity (IBA) streams

under a lean-agile or “leagile” distribution strategy that employs postponement and mitigates variances in demand.

Under a lean distribution strategy, products under the base demand stream can be made to stock and orders can be satisfied from finished goods inventory on hand. Since demand from the base demand stream is predictable, the sponsor company can manufacture goods in anticipation of demand with reasonable assurance that they won't end up sitting on a surplus of inventory. Through customers segmentation, I found that roughly 15 of the sponsor company's customers drive approximately 80% of the base demand shipments with the top customer being responsible for 32% of total base demand shipments. Therefore, the sponsor can strategically store inventory for the base demand stream in the mixing centers that regularly services those particular customers. The sponsor company will be able to maintain its high service levels for the base demand stream since this strategy does not deviate from the one that the sponsor company already has in place.

The new initiatives stream would benefit from the flexibility inherent in an agile strategy because under this replenishment profile, new stock keeping units are brought to market for the first time. Since one customer drives 74% of the activity in the new initiatives stream, the sponsor company has 2 options; (1) it can either directly ship the products to the customer contingent on transportation costs and shipment volume or (2) it can ship from the plant straight to the mixing centers. For the second option, the products would arrive at the mixing center's inbound lane

and be cross docked to the outbound lane for shipment on the same day. At the mixing center, the products can be consolidated with other merchandise being shipped to the end customer. Both of these options do not necessitate storing the products in a warehouse and therefore decreases inventory holding costs. These options also increase the service level as they reduce the number of touches by passing the warehouse storage and picking functions. The tradeoff from option one is an increase in transportation costs therefore, it should be noted that option one is best for customer one only if there are enough products for a full truck load. The remaining 26% of shipments under the initiative stream are fragmented between customers. Therefore, I recommend the aforementioned option two for the rest of the customers.

Since promotion and IBA streams together only make up 22% of total shipments, consolidating them under a lean-agile or “leagile” strategy that employs postponement would allow the sponsor company to streamline operations by condensing the amount of resources it uses to manage each stream individually. This strategy

calls for lean operations in the production of generic, semi-finished product, and agile accommodation in the customization process. I recommend that the generic form for the products under the pooled IBA and promo streams be held at the mixing centers and customized accordingly when the demand signal is received. This strategy leverages the use of the resources and the processes that the sponsor company already has in place. By pooling the two streams thereby reducing variability, the sponsor company has the opportunity to reduce inventory without negatively affecting customer service level or product availability.

### Sourcing

In the formulation of a sourcing strategy, it is important to note that the four replenishment streams are not a property of the SKU. Since a SKU can occupy any of the four streams, it does not make sense to differentiate the supply chain by the four identified replenishment streams in sourcing for products that use similar materials. Treating the streams the same would allow the sponsor company to leverage economies of scale when procuring raw materials. Therefore, I recommend that the sourcing decision should be based on the variability and volume of individual SKUs.

To summarize, my recommended approach would be to source materials for the high-volume, low-variability SKUs or the “A” SKU’s, representing 80% of volume and only 12% of SKUs, from distant low-cost sources since demand for them is more stable. This should be evaluated against lead time and transportation costs. Contracts for raw material for these SKUs should be strategic and long

### “Leagile” Distribution Strategy

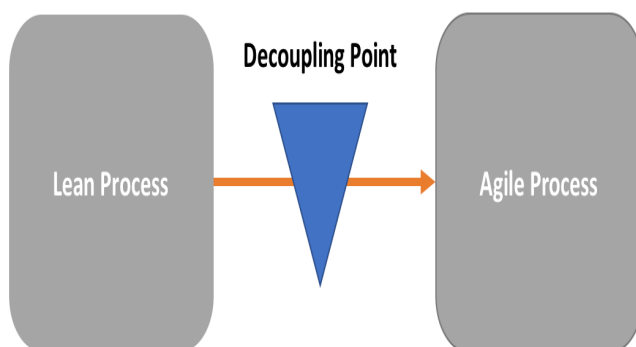


Figure 2: "Leagile" Distribution Strategy

term to reduce risks. "B" and "C" SKUs, as characterized by their high volatility and low volume, make up the remaining 20% of shipments. In order to maintain agility in the supply chain, I recommend that these remaining SKUs be sourced closer to market. Since they

are highly volatile, sourcing them closer to market will increase the sponsor company's customer responsiveness therefore minimizing lost sales. In addition, sourcing "B" and "C" SKUs together will allow the sponsor company to leverage economies of scale.

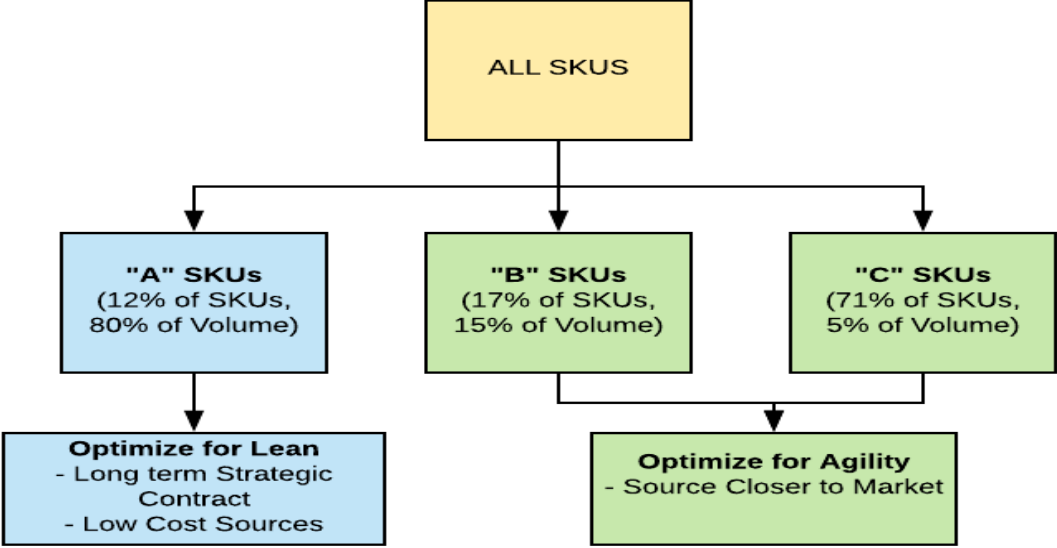


Figure 3: Sourcing Decision Tree