Integrating Multi-Echelon Inventory Optimization into Inventory Planning Process

**The Challenge:** A global industrial manufacturer faced high inventory levels across their global supply network. With approximately 50,000 products, a deep bill of materials and a large number of components manufactured in one plant and assembled in others, the client’s inventory planning process lacked the ability to effectively plan inventory levels across their network.

The client’s inventory planning process was manual and while effective for simple products, had limitations on analyzing and optimizing inventory targets across multiple sites, items and echelons. As a result, products were set up as purely build-to-order or purely build-to-stock with little ability to effectively postpone inventory and still support short order lead times. Additionally, the current process had a limited ability to evaluate impact of customer service level and lead time variability on inventory levels.

**The Approach:** To address these problems, the client engaged Spinnaker to help select and implement a multi-echelon inventory optimization (MEIO) tool that would be integrated into a monthly inventory planning process.

To prove the approach, Spinnaker and the client developed a proof of concept which modeled a representative subset of products and demonstrated the potential savings. This model was also used to model scenarios to evaluate impact.
of key drivers such as service level, service time, lead time, lot size, and replenishment frequency on inventory levels.

To implement the full-scale integrated inventory planning model, Spinnaker worked with the client team to design a “planning data store” (“PDS”) integrated with SAP. This PDS was used to house extracted data, create required tables and fields, and validate the data using structural and integrity checks before uploading to the modeling database. In addition to a baseline model, the PDS allowed the client to model scenarios, analyze results, and formulate recommendations for safety stock targets.

**The Solution:** A Spinnaker team and a core team from the client engaged in developing best-in-class integrated inventory planning process and supporting system. The diagram and description below provide a high-level overview of the solution design.

**Integrated Inventory Optimization and Planning System**

**The Results:** By integrating multi-echelon inventory optimization into the monthly planning process, overall inventory fell by approximately 20%. Of this overall savings, about 16% of inventory savings were achieved from safety stock reductions and the remaining 4% was derived from cycle stock reductions based on lowering min order size and replenishment frequency. Besides lowering inventory levels, the new system and process provides capability to evaluate multiple factors impacting inventory and devise the optimal inventory strategy.

**Key Team Accomplishments:**

- Detailed data requirements and source identification
• Documented data mapping and specifications
• Defined data validation logic and data governance process
• Designed planning data store for data management including input data extraction, transformation and validation process
• Defined output analysis process workflow
• Defined scenario management and analysis process
• Designed integrated inventory planning process

About Spinnaker:

Spinnaker is a supply chain services company that helps clients grow, manage risk, reduce costs, and improve customer service by developing world-class supply chain capabilities. Our services help clients develop the right supply chain strategy for their business challenges and implement the process and technology solutions to improve Demand/Supply Planning, Procurement and Sourcing, Logistics and Warehousing, and Reverse Logistics business performance. Spinnaker offers a unique service delivery model that combines the strength of deeply experienced management and technology consultants with a seasoned team of business process outsourcing (BPO) and 3rd-party logistics (3PL) professionals. Founded in 2002, Spinnaker has offices in Boston, Columbus, Denver, Houston, Memphis, Pittsburgh, London, and Singapore.

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