

Meeting the Challenges of Supply Chain Management

Brand owners require innovative product configuration strategies to optimize supply chain effectiveness



By John R. Kenney, Jr., ModusLink Corporation

Price and margin erosion, high logistics cost, increasingly shorter life cycles, the acceleration of product introductions and a competitive imperative to maintain product availability “on the shelf” is driving change in supply chain management strategies. As brand owners accelerate new product introductions globally and strive to promote customer brand loyalty, the challenge to optimize the supply chain becomes increasingly more complex.

To synchronize all these elements of the supply chain, intelligent tools and operating techniques are required to better manage the balance between the supply side of the equation with the demand side. The traditional supply chain strategy of assembling consumer products in a significantly lower-cost region of the world, such as China, and shipping these products fully configured and packaged to other regions of the world is increasingly being challenged.

Traditional Supply-Side Strategies Can Neglect Demand Dynamics

Supply chain strategies were typically developed to support product movement (in volume) from lowest-cost manufacturing locations to regional distribution hubs, as well as to match product availability to a sales forecast. Most supply chain advanced planning and scheduling systems have been implemented to optimize manufacturing planning processes. This manufacturing-to-distribution strategy, heavily dependent on transport, is fine for the supply side but neglects the demand side of the value chain. Supply-side strategies are not designed with the customer in mind and do not take into account their influence on demand.

Within this model, strategies for how to best service the customer generally begin at the physical point of distribution, which is too late to deal with exceptions. With high levels of forecast inaccuracy and longer, more variable manufacturing and logistics lead times, a manufacturing-to-distribution strategy can result in idle inventory, excessive rework, lost sales and a poor customer service experience.

Innovative strategies and technologies are required to manage global complexity and synchronize all elements of the supply chain to work in harmony with the clear objective of getting products to market quickly, while ensuring customer satisfaction and a lower cost of supply chain ownership. One approach is to retool the supply chain to a demand-driven, optimized product configuration strategy that succinctly aligns both supply and demand.

Finding the Balance with an Innovative Strategy to Optimize Supply Chain Effectiveness

As companies extend their supply chains across the globe, they face increased risks associated with product planning, supply availability and customer demand. Each presents unpredictable characteristics that, with the slightest variation, will inevitably derail a supply chain. A supply chain designed to be lean and demand-driven mitigates the effects of risk due to inherent flexibility and readily deployable production options.

Optimized product configuration is a supply chain strategy that synchronizes supply to demand activities through the effective use of subject matter expertise, business processes, technology and geographic footprint. In its simplest terms, optimized product configuration improves cost and performance by leveraging the best time and place in the supply chain to perform the physical activity required to assemble, configure and/or package generic base products into a market-ready state. Effective product configuration strategies require analysis of the extended supply chain from forecasting and materials planning through channel management and customer fulfillment. Three key supply chain concepts should be taken into consideration when designing the global product network, including packaging postponement, deferred configuration and demand-driven supply.

To effectively deploy an optimized product configuration strategy requires analysis of total supply chain costs and the trade-offs amongst them, including materials, conversion, inventory and logistics. Other factors, such as taxes, storage and lead time to market, must also be taken into consideration.

Model Success: Determining the Right Model to Meet Specific Demand Needs

Optimized product configuration should not be thought of as a one-size-fits-all strategy. To determine the optimal model, in addition to evaluating cost trade-offs, factors such as product life cycle, forecast accuracy, logistics density, conversion effort, form factor and customer requirements, need to be considered. The three primary models are denoted below along with highlights of the key product and demand dynamics that influence the viability of the model.

Scenario 1:

One model involves performing configuration (final assembly) and packaging of a finished product at the point of manufacture and shipping directly to the channel partner.

This direct ship model works well when the following conditions are present:

- There are few end-market configuration opportunities, and customer requirements for packaging are simple;
- Forecast accuracy is high, resulting in an elevated level of consumption of finished goods;
- Long product life cycles exist, minimizing a requirement to rework inventory;
- Whole-unit demand is economically produced at the manufacturing site;
- High-density logistics are achievable due to condensed form factor;
- The conversion effort is highly complex and is not conducive to being performed in region;

- Condensed form factor exists with high-value characteristics; and
- There are no significant tax advantages to warrant deferred configuration or packaging postponement in region.

Scenario 2:

Another model involves shipping units (in bulk) to a region and performing configuration (final assembly) and/or packaging (postponement) in that region, closer to the actual customer order.

This model works well when the following conditions are present:

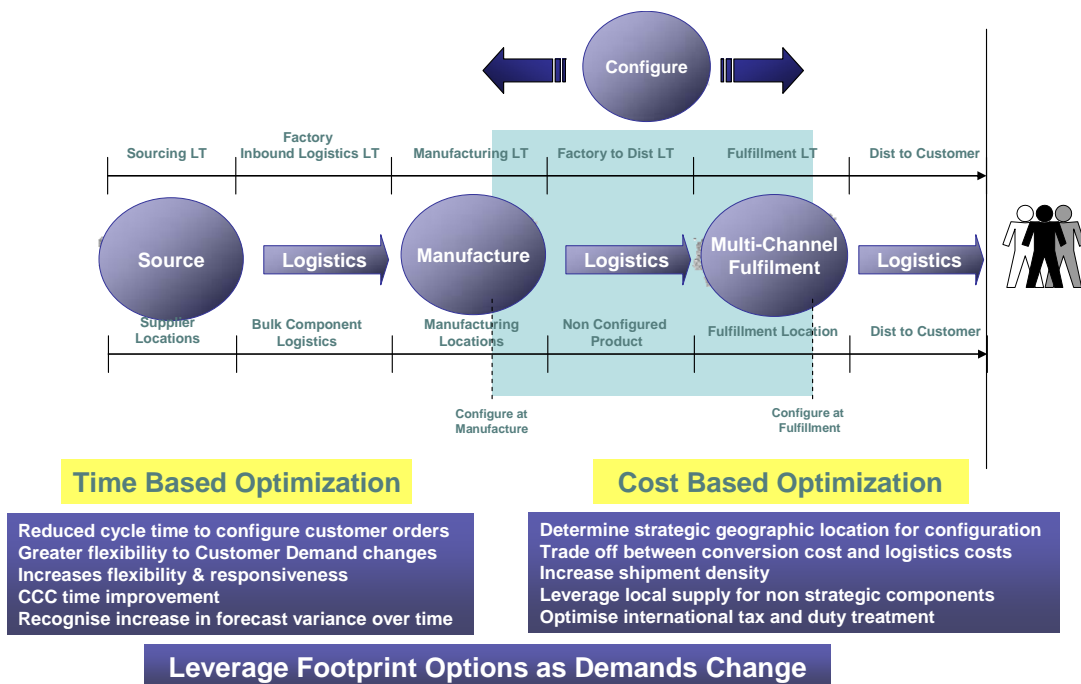
- There are many end-market configuration requirements for finished goods;
- Forecast accuracy is low, which could result in excess and obsolete inventory;
- A short product life cycle exists, which could result in excessive rework of inventory;
- The conversion effort is low with very little complexity;
- The finished-good product is a large form factor and, therefore, more costly to ship; and
- There are significant tax and duty benefits afforded by performing deferred configuration or packaging postponement in region.

Scenario 3:

Lastly is a hybrid model which leverages a combination of the two previously mentioned models for development of the optimal solution. In this case, an analysis is performed on a part-by-part basis to determine which units should be configured and packaged at point of manufacture rather than in region. Hybrid models provide for the ultimate in supply chain flexibility, allowing for variations in the strategy and enabling configuration, packaging and fulfillment from multiple regions or locations within the model.

This model (see Figure 1) ensures that the most efficient and cost-effective production model is deployed for the configuration and packaging of the finished good.

Figure 1. An Optimized Product Configuration Strategy



Understanding the Complexity of Localized Assortments

As brand owners globalize their supply chain to expand their product offerings into other regions of the world, while simultaneously attempting to optimize inventory holdings, they need to understand the complexity and total number of conversions required to support local requirements. The balance between product proliferation, inventory availability and customer service expectation is difficult to attain in a traditional manufacturing-to-distribution strategy. And while form factor has decreased in size, retail packaging has generally increased in size, resulting in fewer units packed per pallet during transport. The shipment of finished goods, whereby the retail carton is significantly larger than the device, commonly referred to as “shipping air,” is a cost factor that needs careful consideration.

Packaging postponement entails the shipment of generic units in bulk to other regions of the world, and kitting and packaging is deferred to local operations to support a wide variety of customer-specific requirements. This deferment adds to the complexity, requiring efficient management of inventory levels to ensure the proper mix of parts and materials to support demand.

In the European Union, for example, channel-specific packaging and accessories are required because of the many variations in languages and electrical adaptor connections. Retail, B-to-B and B-to-C requirements can differ depending on the country in which they reside and what customer-specific presentations are needed. Documentation, software, license agreements, rebate promotions and marketing materials are all examples of items that must be properly managed and localized to meet regional requirements and ensure a successful customer experience.

An analysis of supply chain cost, including materials, conversion, inventory, logistics and the trade-offs amongst them, should be taken into consideration. Even more important is a review of the tax treatment trade-off between the tax code of a finished good and that of the individual component part packaged. Significant tax savings can be realized when this is incorporated into the decision process.

By pulling forward the commitment to kit and package goods in a regional location and closer to when a customer order is taken, brand owners gain more flexibility in their supply chain, and component inventory and finished goods availability are optimized.

Understanding the Benefits Associated With Localized Assembly

Product innovation has become increasingly complex. More and more new products are designed as intelligent devices requiring some form of personalization. In some instances, hefty duties and taxes are imposed upon these intelligent devices, if fully assembled, when imported into the European Union.

One example is deferred configuration of products manufactured in Asia. Generic unit subassemblies are shipped in bulk from Asia to other regions of the world and final configuration (assembly) is then deferred to local operations in support of a wide variety of customer requirements. This includes activities such as:

- Personalization (product printing, custom colors and on-demand manufacturing);
- Content load (loading media directly onto a device or attached memory card);

- Service activation (wireless carrier requires activation, serial-number tracking and reporting);
- Firmware loading and product flashing; and
- Loading local language settings.

As in the case of kitting and packaging postponement, an analysis of supply chain cost and the trade-offs among them, including materials, conversion, inventory and logistics, should be taken into consideration when making a decision. Depending on the product code classification of finished goods versus the classification of the subassembly components that make up the finished good, taxes could be reduced upon import. These classifications need to be assessed on a product-by-product basis to determine if a deferred configuration strategy provides beneficial tax relief.

Understanding the Chain Reaction of Poor Demand Planning

Supply chain strategies driven by a sales forecast rely heavily on accuracy to achieve successful metrics. With combined manufacturing and logistics lead times upwards of 12 weeks, it is not uncommon for a distribution hub to face difficulties filling customer orders at a given time. This is significantly more prevalent in the technology sector, where forecast accuracy for computing, storage, telecommunications and consumer electronics products average only 30 to 50 percent accuracy at the part-number level. This implies that the mix of products held at the distribution hub will not be sufficient to satisfy the actual orders placed by the customer.

Maintaining the proper mix of finished goods can be further challenged by a requirement to deliver products to multiple distribution hubs. And these challenges are compounded by regional assortments, increasingly shorter life cycles and the acceleration of product introductions. Inaccurate forecasting is very costly and can result in excess and obsolescence, shortages and customer dissatisfaction. Nevertheless, companies often rely on these forecasts and use them as the basis for their inventory and production planning. As a result, finished goods inventory is not only in the wrong mix but generally at higher stocking levels than is necessary.

In order to deal with uncertainty, sophisticated forecasting and replenishment programs are needed to simplify the planning process. This is only accomplished through the processing of real-time information.

Implementing Demand-Driven Practices to Support Better Operational Performance

Demand planning includes all the processes associated with forecasting, planning and inventory management required to meet customer demand. Sophisticated analytical and evaluation tools are needed to effectively integrate demand-planning functionality into inventory replenishment systems. Successful applications are dependent on collecting information, applying it to drive inventory rules for replenishment and constantly evaluating it. The power of a demand-planning methodology is to optimize the flow of goods for every item in every location.

Heavily dependent on customer information, demand planning requires collecting data about historical shipments, volume variability and future demand on a part-by-part basis to assist in the design of a robust inventory replenishment process.

Benefits from installing demand-planning systems are almost immediate: Inventory turns go up, inventory levels go down and higher customer service levels are attained. More important, demand planning systems are highly redundant and focus the attention of planners on exceptions, which helps companies deal with fluctuations in supply and demand variability with greater flexibility. Demand-planning systems enable companies to redirect the source of supply to other locations with relative ease.

In an increasingly uncertain economy, further complicated by the complexity of managing the dynamics between supply and demand, companies need to deploy strategies to keep their supply chain in sync. The right technology solutions, coupled with a demand-driven supply chain methodology, align supply to demand in the most cost-effective manner and get products to market quickly, while ensuring customer satisfaction and a lower cost of supply chain ownership.

Bio

John Kenney Jr. is global director, Supply Chain Solutions, for ModusLink Corporation. He has seven years of experience in providing subject matter expertise on global supply chain solutions and models through client-facing analysis and presentations. Mr. Kenney has developed value-added supply chain solutions for blue-chip clients in the computing, software, communications and consumer electronics industry segments.