

Supply chain and manufacturing: Focus on three “Vs” to improve supply chain management

Aerospace and defense executives should increase their value chain visibility, better manage demand variability and increase velocity to help improve profitability in today's market. Being able to see what inventory is in the pipeline and manage it effectively and efficiently is a valuable means to managing the cost structure and schedule of any program.

Visibility, variability and velocity.

Focusing on these three factors is key to increasing the effectiveness of any company's supply chain. Unfortunately, many aerospace and defense manufacturers may not realize they have a problem in these areas if they don't have the ability to access and analyze the right information or a reluctance to change current business practices.

Visibility and variability problems can have serious ramifications on a company or a program's supply chain.

- A lack of “visibility” to program demand (at all levels of the program) can result in high inventory levels which interfere with true demand-flow manufacturing, or low inventory velocity, which masks upstream/downstream performance issues.
- A lack of “material” visibility and event management can lead to an inability to respond to urgent customer requests, which can negatively impact consumer satisfaction and increase program costs.
- High “variability” in product development and engineering changes beyond the baseline may also require high variability in engineering, product and manufacturing capabilities, leading to increased life-cycle costs for programs.
- A lack of “velocity” can impact a company's ability to make and implement quick yet strategic decisions.

To manage their supply chain successfully and help their companies transform to “ruthless competitor” status, aerospace and defense manufacturers should consider developing a corporate vision that optimizes operational excellence, provides insightful analytics, deploys and measures strategic initiatives, and identifies and manages risks. To do that, companies should focus on consistent business practices and develop well-defined and aligned business, technical and operational strategies that increase their flexibility and speed and allow them to adapt to market dynamics in a profitable way. These initiatives should include supply management strategies such as sourcing and commodity and supplier development, as well as total cost management and performance measurements. In addition, corporate executives, business unit managers, program managers and operations personnel must support the company's overall strategic vision in order for that vision to succeed.

Other areas on which aerospace and defense manufacturers should focus to reduce supply chain costs, improve asset productivity, manage risks across all departments and increase their global footprint include the following:

Inventory management

Inventory is one of the most dangerous assets companies can have. Although having inventory on the balance sheet is an asset in some eyes, it can also be a liability for several reasons. The risk of inventory becoming damaged or obsolete due to a new product design or a customer's changing requirements increases every day that a company holds onto it. Excess inventory costs money, takes up valuable warehouse and plant space and can hide deeper problems in demand planning, manufacturing and sourcing processes. Eliminating excess inventory requires that a company first eliminate any underlying problems that may be contributing to its buildup.

Companies that do not know the status of their inventory due to poor supply chain visibility tend to overcompensate by having excess finished-goods inventory to satisfy unexpected customer demand, extra work-in-progress inventory due to unreliable or faulty manufacturing processes or equipment, and excess raw-material inventory because of unreliable suppliers.

The goal is to establish a balance. To eliminate the need for such excess stock, aerospace and defense manufacturers need to improve the accuracy of their inventory through strategic initiatives such as demand planning, automatic allocation and continuous replenishment programs. Successful inventory management can help companies increase inventory turnover, reduce inventory levels and increase on-time program deliveries. In addition, the ability to track inventory throughout its life cycle allows companies to know at all times what is available-to-promise at all locations and therefore improve customer service.

Product development

The lack of integration between product development, engineering, manufacturing and program managers is a leading cause of poor inventory

management. The inability to link these three crucial areas can lead to inaccurate production estimates and result in too much or too little inventory. Since few companies can accurately track their fully loaded production costs, it is extremely difficult to benchmark improvements. However, product development, strategic sourcing and plant layout are all critical factors in reducing manufacturing costs.

Considering that 70 to 90 percent of a product's cost is locked in before manufacturing even begins, executives should find ways to manage their product development costs early in the process. The factors that should be taken into account include gold plated engineering specifications, production related trade-offs between capital and labor, program learning curves, difficult to control manufacturing processes and location dependent inherent production costs.

Although there has been a big push to move production to countries with lower-cost labor, companies should be careful that other costs, such as the new location's overhead burden, transportation requirements or information gaps do not supersede any expected savings. Logistics costs also should be factored into product development, including where the product is made, where the raw material to make the product comes from and where the product needs to be shipped to reach its customers. New regulations on restricted materials and carbon management also come into the equation for many programs. Driving down production costs typically requires broad reengineering efforts rather than small process changes.

Profitability management

Companies can measure profitability at the product, program and customer level. Research shows that a substantial proportion of a company's products/customers do not make money. The tricky part is trying to figure

out which products, programs and customers fall in the profitable versus nonprofitable category. Aerospace and defense manufacturers that struggle to accurately allocate overhead and semi-variable costs cannot make well-informed, quick decisions about which products/programs to continue and which to sunset. Executives need to rely more heavily on business analytics to determine which customers and programs are their most economically profitable and offer the highest growth opportunity. In addition, companies need to be willing to focus on the 20 percent of those products/programs/ customers that are the most profitable and pay less attention to the other 80 percent. This is not an easy task—especially when the company is supporting the original equipment in missions around the world for 30+ years.

Network planning

Once a company solidifies its portfolio programs and products, it needs to map out where its suppliers and customers are located. Few companies map the physical movement of their products from their suppliers to and through their manufacturing facilities to their customers assembly or field locations. Addressing the fact that a company's plants are manufacturing the wrong products in the wrong cities can be costly. Shortening the distance between manufacturing plants and customer locations to facilitate lean and just-in-time manufacturing decreases the cost of logistics and improves inventory management. Shortening the distance can also be virtual—case in point where one Commercial Aerospace supplier deployed supply chain technologies directly in the hangars of its key customer to have immediate visibility to components coming “off wing.” This allowed the company to cut in half the required support inventories on this program and increase turn around time.

Demand management

Successful demand management—which includes demand planning, supply planning, forecasting and production scheduling—directly impacts inventory management by ensuring that all future demand is identified, evaluated, prioritized and scheduled efficiently. Effective supply planning and production scheduling can help manufacturers optimize the use of their inventory, supplier capabilities and transportation resources.

Many inbound supply chains, from a systems engineering perspective, would be considered as processes that are not in control. The variability in supplier delivery times would often break through traditionally established upper controls limits; similarly, repair cycle time standard deviations have often been observed to be 100 days or more. This lack of precision, coupled with inadequate demand planning could build excessive buffers and levels of safety stocks while driving up costs.

Information technology

During the past 20 years, companies focused on developing islands of automation, building localized ERP/ MRP capabilities and experimenting with e-business. As a result of this trend and through heavy consolidation in the industry, organizations have built up 20 years' worth of disparate systems, exacerbating their supply chain visibility problems in the process. In addition, companies with multiple manufacturing support systems cannot easily access the data they need to compare production costs or determine which programs are creating true economic profit.

This will not be an easy, or inexpensive, problem to fix. In addition to implementing integrated information technology solutions to optimize operational excellence, companies also

need to invest in advanced technology that, for instance, allows them to create common industry data models that allow them to see the status of their order across a confederated network of suppliers and sub-contractors. The key challenge for aerospace and defense manufacturers will be to find the right hardware, software and middleware solutions to help them perform business analytics and improve their supply chain visibility, particularly in today's risk sharing partner world.

The success of any organization will depend on its competitive advantage. The difference for today's aerospace and defense manufacturers, however, is that competitive advantage is no longer based solely on technological superiority but also on market based affordability: both acquisition affordability and total lifecycle affordability. Manufacturers that successfully increase their customers' success by addressing the above affordability, service and customer management challenges can, in turn, increase service revenue growth, improve customer loyalty on a program or platform, and reduce costs through improved/common processes.

Change management

A renown professor of social science and author of business management books, asserts that 66 percent of people will resist specific changes or, at best, be neutral to them. Building a “change architecture” is required in order to implement business processes that truly improve supply chain visibility. Aerospace and defense manufacturing executives need to embrace change management programs—like never before—to help customers, employees and suppliers overcome their resistance to new business practices and ideas and do what is necessary to improve the total value delivered to customers.

Visibility, variability and velocity

Quality management

Although institutionalized quality programs are necessary, organizations tend to hide behind these single-dimension programs. Instead, aerospace and defense companies should focus simultaneously on quality, cost and lead-time performance to achieve sustainable results. Companies have to be able to produce a product at a cost that is economically profitable. In order to do that, they need to develop a target-costing scenario, a true understanding of product development and an effective quality management program. This will also help them better identify, mitigate and manage program risks.

The goal for any aerospace and defense manufacturer is to optimize operational excellence across the value chain by producing for demand, designing the best product possible, minimizing product delivery costs and reducing total life-cycle costs. To do that successfully, companies need to articulate their supply chain strategies clearly, align their

processes with these strategies, deploy appropriate technology to sustain these processes and empower their people to use analytics to grow the business profitably. Doing so will, in turn, help companies improve their supply chain visibility, better manage their product variability and increase their velocity in making strategic decisions, all of which will positively impact supply chain management throughout the value chain.

How PwC can help

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