ANALYST CONNECTION

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How Postrecession Policies Are Transforming the Aerospace and Defense Supply Chain

December 2010

As with other manufacturing sectors, the aerospace and defense (A&D) industry has felt the impact of the recession. In response to economic conditions, A&D manufacturers will need to develop new materials, technologies, and manufacturing processes. In addition, manufacturers will have to collaborate more effectively and efficiently with suppliers in an effort to reduce costs.

The following questions were posed by Oracle to Joe Barkai, practice director for IDC Manufacturing Insights' Product Lifecycle Strategies research service, on behalf of Oracle's A&D customers.

Q. What are the key trends driving transformational change in the A&D industry?

A. For years, common wisdom was that the A&D industry is resilient to economic downturns. The rationale for this notion was the long life expectancy of defense programs and commercial assets, which, in turn, created long order bookings fueled by a steady funding stream of government and defense programs.

However, the current recession has tested this assumption, as indeed the A&D industry has not been left unscathed. Low liquidity and the unavailability of credit, combined with concerns about long-term fuel costs and heightened security, have led to delays and cancellations of orders. These issues have been compounded by technical and materials problems with promising the A380 and 787 "game-changing" airframes, which involve disruptive technologies, new manufacturing processes, and innovative global supply chain strategies.

That being said, there are some glimmers of optimism. On the commercial side, we expect to see an increase in air traffic, especially with freight and in emerging geographies such as Asia and Latin America. Of course, this growth will increase competition between traditional players as well as new manufacturers and carriers, forcing manufacturers to be leaner, to be more efficient, and to pursue additional revenue opportunities.

On the military front, the current need to maintain the level of readiness of the armed forces will continue to drive investments. In the longer term, changes in strategy will gradually transition from sustainment to new technologies and programs. For example, the demand for unmanned systems has increased by 600% since 2004; it is likely to double by 2015, possibly sooner.

Q. Specifically, what is the impact of these transformations on A&D manufacturers and suppliers?

A. Even in a postrecession economy, A&D manufacturers and suppliers will continue to face challenges. For example, defense spending typically runs in 20- to 25-year cycles, and the level of defense spending is going to decline with retraction in the war effort. Government R&D funding for NASA and other programs will also decline as social priorities shift. Manufacturers will be forced to self-fund programs and become very efficient in using scarce resources.

The reduction in government funding and the overall need to reduce R&D and manufacturing costs will further challenge manufacturers to develop new materials, technologies, and manufacturing processes.

Manufacturers are already rethinking manufacturing integration and supply chain strategies. In an effort to reduce costs and improve manufacturing efficiencies, many producers have migrated from traditional vertical integration to a flat and highly distributed manufacturing model, only to find that their suppliers and partners are ill-equipped to handle the increased collaborative technologies and global supply chain complexities. Companies will need to rationalize new manufacturing and supply chain strategies and learn how to better align capabilities across the new extended supply chain.

Government contracts are shifting from sole-source award to multisupplier contracts, placing pressure on defense contractors to optimize their programs' performance. Additionally, new mandates for performance-based contracts force manufacturers, as well as service providers, to accept more responsibility for the results and TCO of the program. Instead of specifying cost, time, and labor targets, these contracts spell out desired outcome, such as asset availability and mission readiness. Similarly, manufacturers expect contractors and supply partners to engage in this risk and reward gamble. These arrangements increase risk and uncertainty and require manufacturers, suppliers, and service providers to improve their ability to forecast demand and supply while making manifold improvements in operational efficiency.

Finally, striving to protect and pursue additional top-line revenues, manufacturers, suppliers, and carriers with excess maintenance, repair, and overhaul (MRO) capacity will offer repair and maintenance services.

Q. How well are A&D manufacturers equipped to address these changes from an IT infrastructure perspective?

A. Overall, A&D manufacturers have IT systems in place, but they have not always kept current with the rapid rate of change. Many platforms and applications are antiquated ("green screen") and provide only limited visibility into the enterprise's and suppliers' capacity and inventory. As manufacturers move from vertically integrated operation to a distributed design and manufacturing environment, the existing infrastructure is suboptimal to realize a secure flexible and extensible platform. Consequently, many companies find it challenging to plan, coordinate, and manage across programs, functions, and matrix organizations.

IT systems need to be able to manage programs and processes across the extended enterprise and provide real-time visibility into supplier progress, capacity, and inventory. They should enable extending collaboration of sales and operations planning to internal and external stakeholders while maintaining necessary intellectual property (IP) and data security.

Another area is the ability to manage complex product structures and their configurations. This need spans not only engineering and manufacturing but also supply chains, sales, and contracting. One of the side effects we often see is poor visibility across programs and products, which reduces knowledge transfer and reuse and which often results in higher program costs and longer time to market.

Q. What other factors should A&D manufacturers consider?

A. The A&D industry is facing a growing shortage of experienced workers. More than 50% of the A&D workforce is 45 or older. This aging population is exiting the workforce at a much higher rate than replacements are entering the workforce. The decline in headcount — and in experience and expertise — will force manufacturers and suppliers alike to improve the allocation of scarce resources.

Q. What do A&D contractors and suppliers need to do to compete effectively and to excel in this changing landscape?

A. Manufacturers should drive excellence in three areas: innovation, profitable growth, and productivity.

The innovation challenge for A&D companies revolves around the coordination of simultaneous development of mechanical, electronic, and software systems and harvesting and coordinating design and manufacturing knowledge at key suppliers. Manufacturers should invest in product data management (PDM), product lifecycle management (PLM), and similar collaboration tools that enable better, faster product and program portfolio decisions.

Because A&D programs are managed as very large and complex individual projects, manufacturers do a very poor job in reusing IP, especially IP developed by suppliers and vendors. A&D manufacturers should invest in methods and tools to maximize existing IP, which results in lower cost, faster time to market, and improved quality. At the same time, of course, they need to ensure that collaboration and reuse comply with security and regulatory mandates and provide adequate IP protection.

Rising raw materials costs and unit costs demand that manufacturers continue to consider optional low-cost sourcing. However, low cost needs to be balanced against quality, inbound and reverse supply chain costs, and global risk, so we recommend that the supply chain be optimized for profitable proximity, balancing the variables. Furthermore, A&D manufacturing can achieve additional improvement in efficiency and cost reduction by shifting, when possible, to a capabilities-driven supplier relationship management (SRM) model, where suppliers are contracted for manufacturing and production capabilities rather than for specific components, enabling greater supply chain predictability and flexibility.

However, these models require that manufacturers invest in IT to improve supply chain visibility and the ability to coordinate complex, fragmented supply chains. To drive top-line revenues, A&D manufacturers should do the following:

- Use product configurators and guided selling tools, including faster quoting of engineer-to-order (ETO) products
- Integrate quoting, configuration, order capture, and fulfillment processes across multiple channels to provide a uniform customer experience
- Extend collaboration of sales and operations planning to internal and external stakeholders

- Leverage real-time visibility into supplier capacity to improve service levels, inventory turns, and sourcing decisions

These initiatives necessitate that manufacturers invest in improved analytic capabilities to optimize supply chain operation, reduce inventory levels, and respond rapidly to unexpected supply disruptions with event-driven rapid planning. Manufacturers need to use advanced analytics and planning tools to improve logistics and transportation management as well.

Lastly, a significant slice of asset owners' budgets is devoted to asset maintenance. It is estimated that, on average, asset owners spend 10 to 20 times the purchase cost on MRO. On the other hand, from the service provider standpoint, MRO is a highly profitable business. A&D companies and MRO service providers should boost the performance of maintenance and service operations by:

- Improving capabilities to forecast, replenish, and redistribute service parts across the service supply chain
- Optimizing scheduled and unscheduled service delivery
- Leveraging rotable parts inventories and the reverse supply chain for maximum recovery rates

ABOUT THIS ANALYST

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