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Operational excellence– networked capabilities in aerospace and defense

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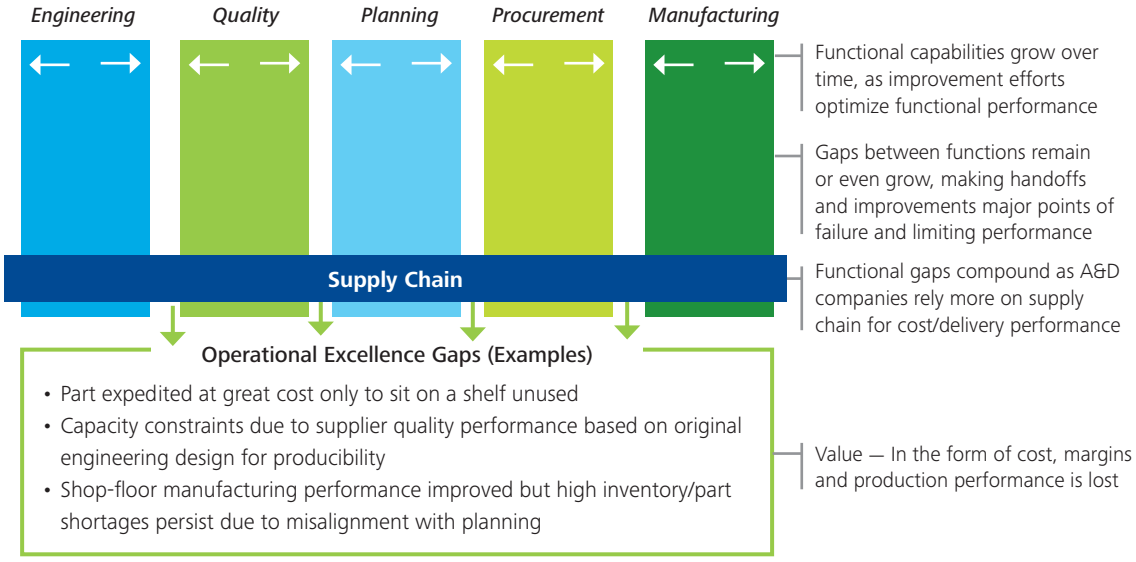
Many aerospace & defense (A&D) companies are under intense pressure to deliver stronger financial performance. This pressure is manifesting itself in increased cost scrutiny, greater execution expectations, and increased customer deliveries and service levels. The margin for error is thin with increasing competition often from non-traditional sources. Both defense and commercial A&D manufacturers, regardless of their position in the supply chain, are balancing greater production expectations with cost reduction mandates. This is a razor-thin line and over-indexing to either de-risk ramp-up complexities or reduce cost can drive failure for any A&D company.

Our experience shows that the key to success in this challenging environment is the interface across internal operating functions. And, with over 70% of the cost of the average program tied to the supply chain, this success often also involves robust alignment with supply partners.

Typical Interface Management Challenge:



Unfortunately, over time, many companies have developed capabilities and expertise that reinforce these functional silos. For example, some companies have a high-performing procurement function and high-performing engineering function but are less mature in aligning engineering and procurement objectives (e.g. Design for Cost). This lack of alignment can be compounded by a management culture and performance metrics that, as the functions excel, make managing the interface increasingly difficult. Functional excellence with weak interfaces can actually destroy value in the form of cost, margin, working capital and production performance.

Companies are striving for better ways to manage cross-functional performance to achieve operational excellence. Looking at this challenge through a different lens, we have defined a set of seven capability areas that lay the foundation for operational excellence. Some of these could be within a functional organization and others are shared across functions.

Operational Excellence Capabilities:

Each of these seven capability areas has multiple individual capabilities. And each of these individual capabilities can be managed and optimized to excellence. But effectively managing an individual capability can reinforce isolation of a function and, sometimes, preclude company-wide operational excellence.

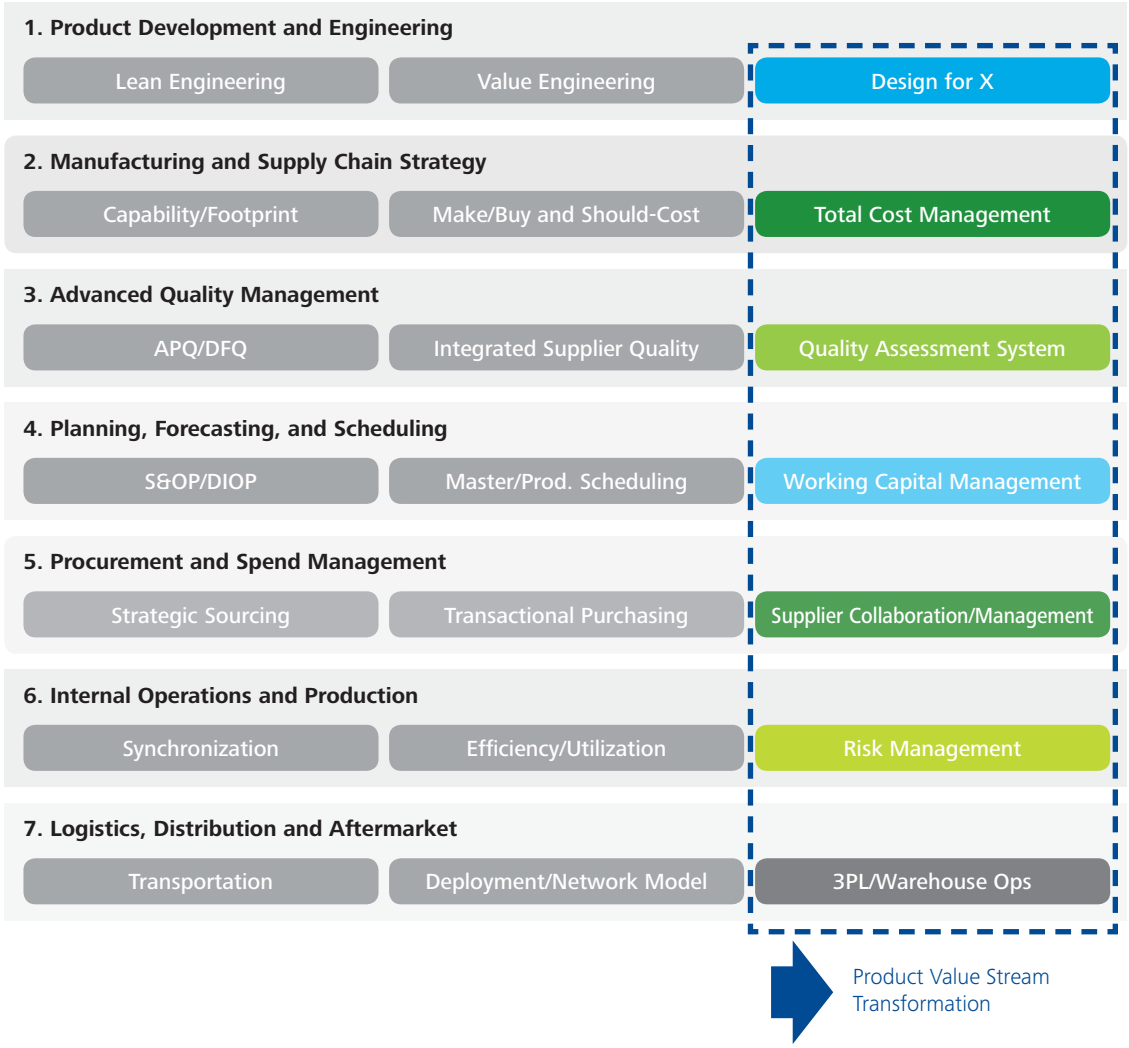
Often optimizing an individual capability can negatively impact another. Consequently, most companies are proficient at managing adjacent capabilities shown horizontally in the diagram. These horizontal capability areas are loosely grouped by organizational function and are therefore typically easier to manage and measure.

Functional capability optimization: *Procurement improvement as an example*

Companies facing both production increase challenges and cost reduction challenges will typically employ functionally-specific improvement efforts. For example, procurement optimization initiatives are common. The emphasis is typically within the supply chain or procurement function with the objective of reducing indirect and direct material cost or improving purchasing effectiveness. These initiatives can drive significant value but often lose effectiveness when other functions are engaged. For example, negotiations with a key supplier about direct material cost can only go so far before an engineering redesign is required to further reduce cost. However, the collaboration between procurement and engineering is sometimes flawed due to misaligned priorities, metrics or leadership objectives.

We have observed companies with more advanced capabilities consider an end-to-end or value stream perspective on performance. These efforts are typically focused on a specific operational problem and target a sub-assembly or portion of the bill of material or specific element of supply. This management approach can be shown vertically in the diagram. Value stream management enables tighter alignment across functions and can provide dramatic improvements especially when managing complex and multi-tier supply chain risks. Specific improvement tools like war-gaming, simulation modeling of tradeoffs, and integrated planning and production synchronization can deliver significant value.

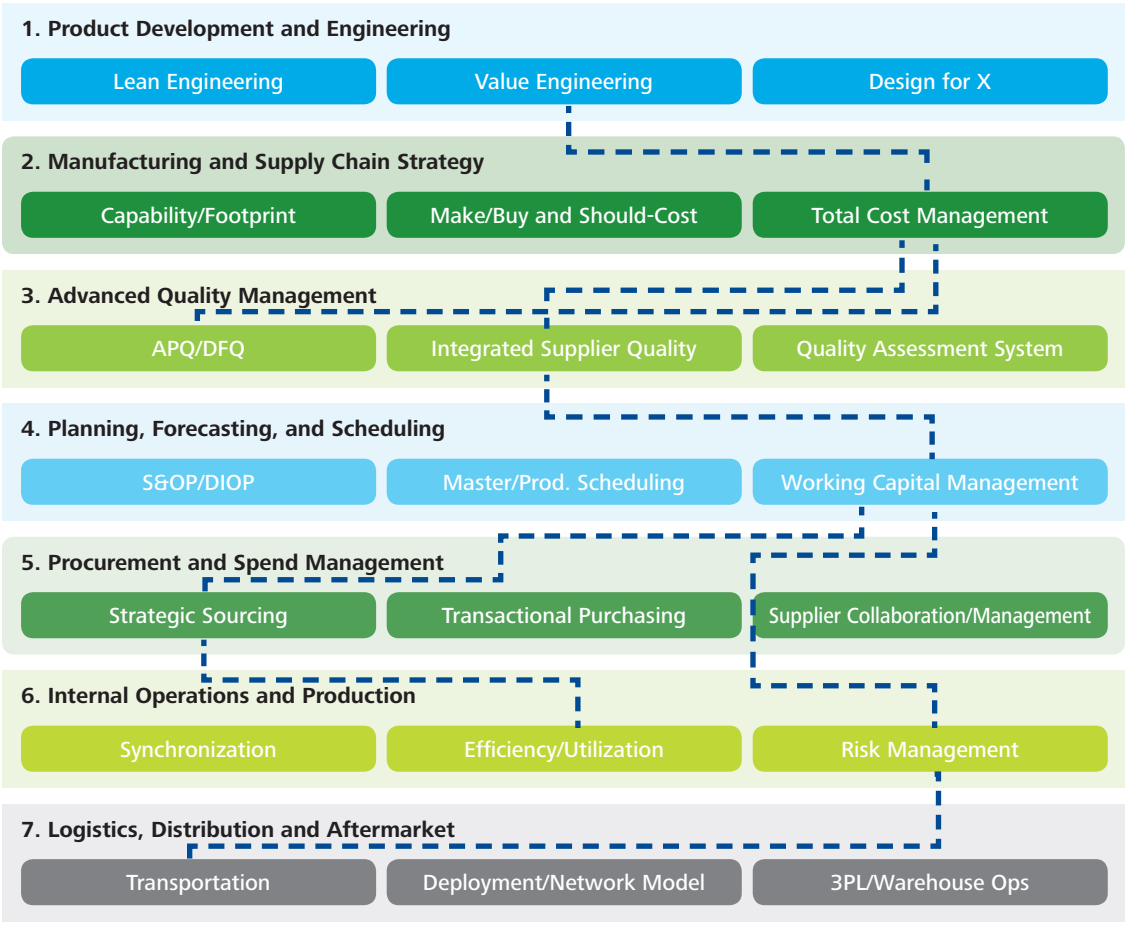
Value stream capability optimization: *End-to-end stage gate process as an example*



However, this approach is also often onerous as it involves stage-gate cross-functional reviews that can lead to slow decision-making. Competing priorities can create decision-making friction as functions optimize to their own performance metrics that do not always align. Also, significant manual analysis of information from within each functional area is regularly necessary to effectively support management decisions.

A new approach to operational excellence is evolving that builds upon a horizontal functional excellence foundation and expands beyond the vertical value stream management structure. This operational excellence approach is a network-oriented management philosophy that expands and contracts across individual capabilities depending on the challenge faced.

Operational excellence: *Networked decision making as an example*



This networked model can support rapid decision-making building from individual capability nodes and connecting information to support the speed and accuracy of management decisions. Advanced insights are needed to support this model. Data resident in individual functional silos must be aligned, performance metrics are often reconfigured to support integrated decision-making and, sometimes, organizational roles and responsibilities are impacted. New advanced analytics techniques and collaboration tools are often key enablers to operational excellence.

For example, a global A&D manufacturer recently invested to develop operational excellence capabilities when faced with the challenge of increasing production while lowering cost. The specific focus was on value engineering in collaboration with suppliers to support enhanced production capabilities. In a functional excellence model, these efforts would have been optimized within three distinct functions: engineering, procurement and production. In a value stream model, these three functions would be integrated together around one specific part or sub-assembly. The objective in this case was to look holistically across an entire portfolio of parts from a single supplier across multiple production work areas to design efficiencies into the product. This was a complex, many-to-many challenge requiring advanced capabilities and collaboration tools, and involving a networked operational excellence model.

The manufacturer created a digital design collaboration environment to speed design improvement efforts across engineering, production and supply chain with the supply partner. The new design center had access to digital design information, usage and performance data, quality data and customer usage information. 3-D models allowed participants to see how a product was assembled in a production area as part of a broader assembly. Multiple participants from across functions worked to solve complex challenges including cost, quality and productivity. This visualization collaboration design center helped to accelerate network decisions to optimize for the whole instead of one function.

This is one example of creating an operational excellence capability to help solve complex problems. Many A&D companies are developing techniques to advance these capabilities and invest in analytics and tools to support rapid decision making.

Deloitte has advised many A&D manufacturers in individual capability development, functional capability development and robust, holistic operational excellence capabilities. Our methodology can help identify previously unexpected areas of focus and opportunities for networked operational excellence.

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About Deloitte's Aerospace & Defense practice

Deloitte is a leading presence in the A&D industry, providing services to more than 95 percent of the *Fortune 500* and more than 80 percent of the *Fortune 1000* A&D companies through more than 600 professionals.[1]

Many of our practitioners have worked in the A&D industry and/or the military prior to joining our organization and have deep industry experience across many sectors. The level of experience and connectivity of these practitioners allows us to provide insights and observations regarding the latest in commercial concepts, technology, and operating procedures in order to address client issues.

[1]Fortune, May 2014