



# Driving Operational Performance in A&D with Supplier Quality Management

In an industry as tightly regulated as Aerospace and Defense (A&D), robust supplier management, visibility, and traceability capabilities are not just nice-to-haves, they are an essential part of doing business. And at the root of all these capabilities lie effective supplier relationships. But



manufacturers in this complex industry cannot simply turn to conventional models for enterprise supplier quality relationship management. Indeed, they face a unique set of quality management requirements and challenges.

Though A&D firms have historically been highly vertically integrated, as new products move to the use of more composite materials, embedded materials, and complex electronics, large A&D manufacturers have altered their strategic relationships with suppliers and in many ways become more “assemblers” than manufacturers. As a result, these companies are requiring a new level of visibility into supplier quality.

While the need for effective supplier relationships in A&D is well known, there are still deficiencies in terms of how these relationships are managed. Some companies are demonstrating world class leadership by achieving a strong alignment of people, processes, and technology to streamline supplier relationships. However, too often organizations in this space face challenges effectively streamlining supplier relationships.

At the heart these matters is the need for Closed-Loop Quality processes that permeate A&D organizations and span their supplier networks. Establishing Closed-Loop Quality will help open the lines of communication and enable A&D companies to collaborate with their supplier base in a way that improves the quality of supplier processes as well as of products before they leave the door. In this research spotlight we will discuss:

- A&D market goals and objectives
- How market leaders achieve visibility into supplier quality performance
- Benchmark data on the impact of these capabilities on manufacturing performance
- Actionable recommendations for achieving effective supplier relationships

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## Drivers in Aerospace and Defense and Quality Management Objectives

Given the paramount importance of air safety and the need for the absolute integrity of defense-based products, A&D has, quite understandably, always been a tightly regulated industry with no room for error in terms of quality. The pressures applied to and felt by organizations in this sphere are in some ways incomparable to those found in other industries.

Regardless, all of this regulatory pressure has ultimately resulted in a more direct focus on a supplier network that collaborates to generate A&D services and products. As stated, many larger A&D companies used to leverage greater vertical integration, with an overwhelming in-house expertise in terms of electronics, machining, metal bending, and many other key manufacturing processes. But with new products, (as Dreamliner and F-22 have illustrated) there has been a movement to the use of composite materials, embedded software, and increasingly complex electronics. As a result, large A&D manufacturers realize the processes they had in place two decades ago—when they were *de facto* their own suppliers—are dramatically different.

Instead, "Supplier Quality Management" is now about visibility into external manufacturing processes that, two decades ago, existed only within internal factories. And supplier networks in A&D are now remarkably complex, with major companies in the field spending billions annually on goods and services across tens of thousands of upstream contract manufacturers and partners, all with differing levels of collaboration. These factors exist amid a climate of more robust competition and increasing customer expectation when it comes to supplier performance from a time-to-market, pricing, and quality management perspective.

The combination of these factors—namely, intense and growing regulatory requirements, time-to-market, and large, complex supplier networks—leads to one obvious conclusion: the need for effective collaboration, better supplier relationships, and Closed-Loop Quality processes has never been greater.

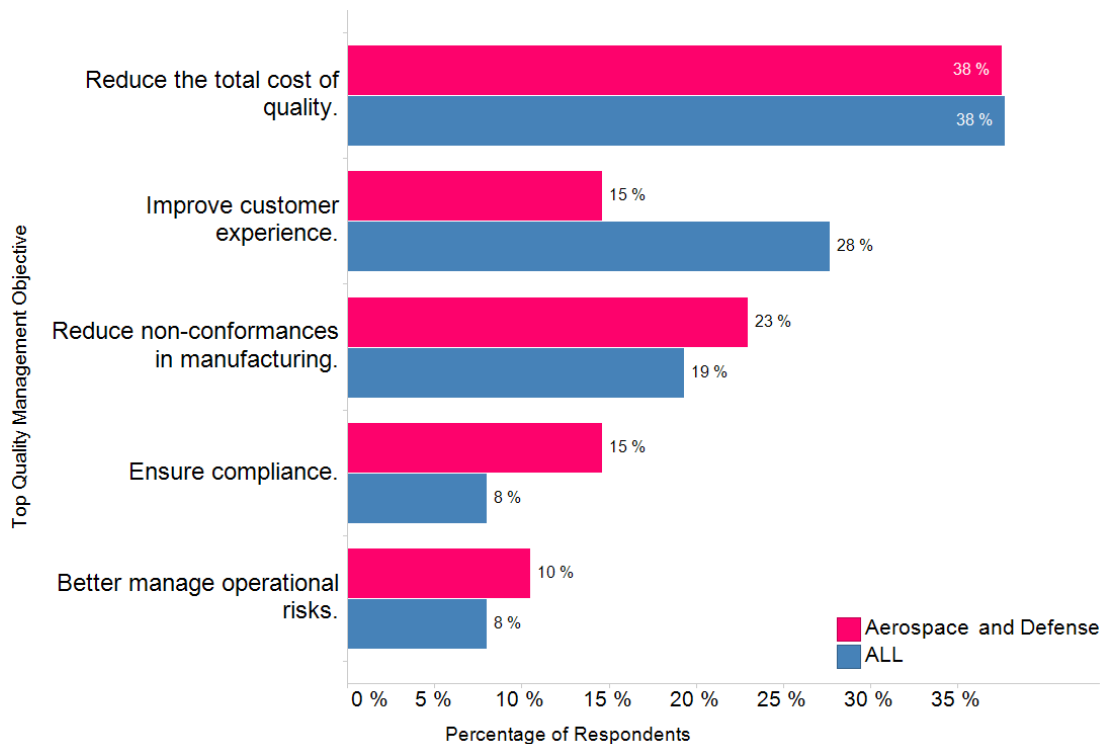
### ***Executive Quality Objectives***

Quality leaders are realigning priorities to better reflect this landscape and to deal with the accelerating, often turbulent nature of their industries. This has manifested in a number of ways. According to our research, quality leaders in A&D focus on three key areas. According to our 2012-2013 survey of quality leaders, 38% indicated that reducing the cost of quality was top priority in terms of quality objectives. At 23%, the second priority was reducing non-conformances in manufacturing, followed by ensuring compliance at 15%. The last metric may seem low, but comparatively, it is nearly double other manufacturing industries (8%).

The combination of these factors leads to one obvious conclusion: the need for effective supply chain management, better supplier relationships, and Closed-Loop Quality processes has never been greater.



## Top Quality Management Objectives



Oftentimes, companies leverage literally dozens of independent supplier quality solutions simultaneously without coming close to the degree of integration needed to support core manufacturing operations.

The responses align well with where we believe A&D manufacturers ought to be going, given the current climate of stringent regulation, increasingly complex supplier relationships, more robust competition, and swelling customer demand for supplier visibility. All these factors point towards the importance of early detection of manufacturing non-conformances and the transition towards managing internal failure costs against managing external failure costs—which can be significantly higher—as non-conformances move from supplier to customer, largely undetected.

### Achieving Visibility into the Supplier Network

We have established that there is a trend insofar as some A&D leaders are working with disparate systems to manage quality at the enterprise level—namely, in terms of non-conformances, corrective and preventive actions, and change management. Additionally, these companies also have multiple systems to manage manufacturing operations, including Statistical Process Control (SPC), Non-Conformance Reporting (NCR), and production execution, all of which are separate in most instances. Oftentimes, literally dozens of independent supplier quality solutions are leveraged simultaneously without coming close to the degree of integration needed to support core manufacturing operations. Furthermore, quality processes managed at the enterprise level are generally not extended to suppliers in a coordinated manner.



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This results in a number of challenges, including the lack of an ability to achieve traceability across components to final assembly, a limited ability to conduct continuous improvement across the supply chain, and the potential for significant deficiencies in terms of time-to-market and successful new product introductions.

To address these challenges, many manufacturers have taken the following approaches:

- Consolidated different systems at the enterprise and plant floor quality levels
- Consolidated systems at the manufacturing operations management (MOM) level
- Identified points of integration, and then extended quality capabilities out to the supplier network

More recently, however, many manufacturing software vendors have made investments to improve quality capabilities built within their own solutions, making significant advancements to both internal and external quality capabilities and visibility.

Because of the widespread challenges with siloed quality process data and content between supplier operations and the manufacturing environment, this platform approach to manufacturing software with quality functionality built in is having a transformative impact on upstream quality. Manufacturers are leveraging this solution to deliver standardized instances of key quality processes such as non-conformances/corrective and preventive actions (NC/CAPA), audit management, and change management out to suppliers via Web-based portals. With these capabilities, manufacturers can track and trace defects and issue corrective actions during supplier processes, which facilitates the identification of quality non-conformances earlier.

Integrating systems has been a perennial challenge for enterprises dealing with an array of sites, disparate, isolated, and siloed legacy systems, and cultural challenges in terms of implementing and leveraging solutions, both internally and across the supply chain. But it is wholly worth finding solutions that “speak” effectively to existing and planned systems, as only that approach will enable true value chain quality performance visibility.

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### *Next-Generation Supplier Quality Management Capabilities*

Despite the challenges, market leaders in A&D continue to achieve greater visibility into supplier quality by leveraging SQM capabilities found within next-generation manufacturing software solutions. These solutions are improving supplier interactions (and, by virtue of that fact, relationships) and enabling unprecedented levels of collaboration, communication, and real-time oversight.

What is an important sticking point, however, is that these solutions essentially cultivate a symbiotic relationship: just as SQM solutions benefit the A&D leader ultimately delivering products and even accelerating the rate of new products to the market, they provide natural benefits to suppliers in terms of improving business performance, meeting customer demand, complying with and exceeding the demands of regulatory requirements, and developing a reputation as an organization that delivers consistent, predictable, and high quality performance.

A lot of this happens by way of Web-based supplier portals facilitating collaboration and the submission of performance data. For instance, many of these tools:

- Provide an automated paperless system that goes well beyond email and FTP for defining, communicating, and collaborating on supplier specifications/expectations
- Use controlled, scalable workflows that enable prompt communication, secure access, and full traceability across the supply chain
- Extend audit capabilities toward supplier sites, using varying degrees of oversight based on past supplier performance
- Use historical supplier performance data to rate and rank suppliers
- Extend key tools for suppliers to use for submitting inspection/process information
- Establish collaborative approaches to resolving quality issues at supplier facilities (as opposed to getting after-the-fact data before product has left the supplier or plant)
- Establish recordkeeping essential for product traceability, enabling better visibility as well as recall/containment capabilities
- Facilitate end-user training and system adoption, which is a critical component to any successful system rollout

However, these linkages are not always obvious to executives reluctant to commit to a certain solution, and there is always the possibility the favored software fails to deliver. On the other side of the coin there is always the possibility an A&D manufacturer and its constituency of end users fail to leverage the system properly. Therefore, it is essential due diligence is paid when evaluating and selecting a prospective vendor, and that the manufacturer has an actionable plan backed by organizational buy-in to take advantage of these next-generation capabilities.





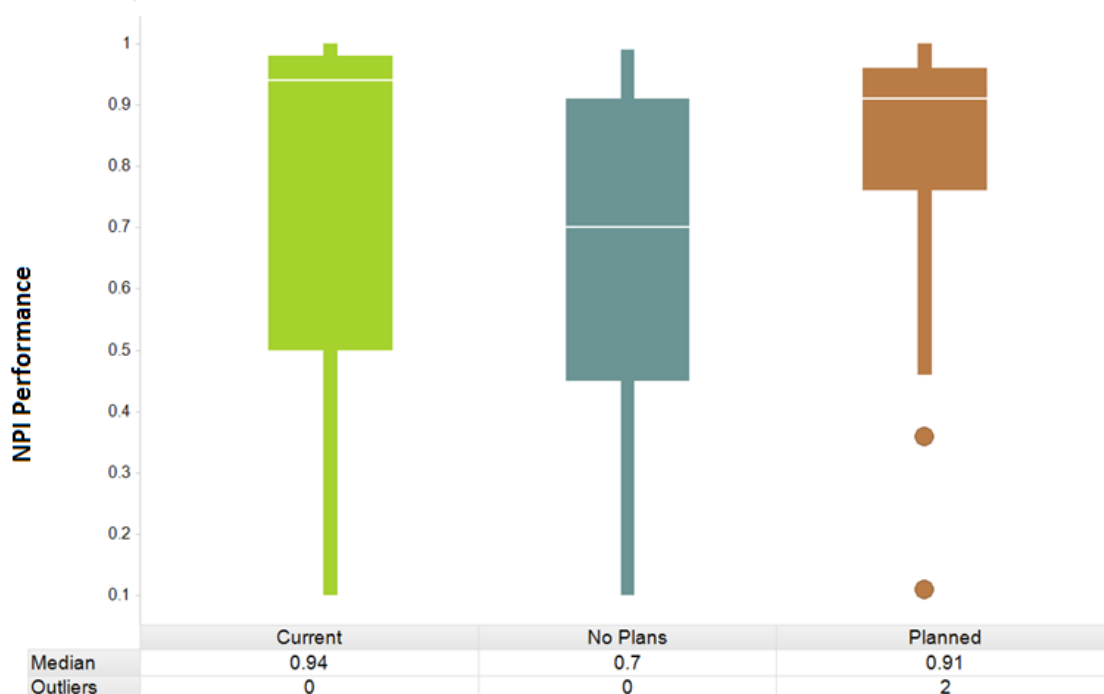
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### The Benefits of Supplier Visibility on Manufacturing

Above and beyond the provision of existing product with associated (and expected) quality standards, the impact of poor SQM and supplier relationship management on New Product Introduction (NPI) processes and capabilities needs to be considered. When manufacturers have better visibility into supplier performance, it simply follows that they ought to have better NPI performance, given the latter is directly related to the former. When manufacturers improve capacity to identify and correct quality and manufacturing issues earlier in the production process, it only follows that NPI processes are improved. Robust supplier networks with enhanced quality capabilities fundamentally translate into more efficient NPI processes and enhance manufacturing operations performance.

### The Impact of Supplier Portals on NPI Performance



Supplier Quality Data Collected Through Web-based Portal

Source: LNS Research

When manufacturers improve capacity to identify and correct quality and manufacturing issues earlier in the production process, it only follows that NPI processes are improved.

Using data from LNS Research’s quality management survey, NPI performance metrics and the actual impact of supplier portals on NPI performance can be put into perspective. As the chart above indicates, supplier quality data collected through Web-based portals linked to suppliers shows a significant, measureable increase in performance compared to those who either have no plans to implement SQM-based solutions to improve NPI. With a median performance of 94% for manufacturers with SQM capabilities versus 70% for those without the capability, the benefits of increased upstream visibility are clear.



## Actionable Recommendations for Achieving Effective Supplier Relationships

We have seen that the climate surrounding A&D suggests in no uncertain terms that effective supplier relationships—established through robust communication, coordination, and collaboration—will continue to simply be an inexorable part of doing business. We have also seen that, while some market leaders demonstrate leadership in this regard through a proper alignment of people, processes, and technology, many still lag when it comes to leveraging software solutions—namely supplier collaboration portals—effectively.

While at times it seems the software that provides these capabilities is a nice-to-have, increasingly it is simply becoming a cost of doing business in this sphere. But it should also be well understood that this “cost of doing business” generates significant ROI through reduced rework, scrap, customer complaints, and the cost of noncompliance.

Indeed, there are also clear benefits of OEMs learning to work with suppliers within a symbiotic relationship where both ends of the spectrum realize the business value of achieving true end-to-end, supplier-to-manufacturer-to-customer quality integrity. The greater the alignment, the more individual manufacturers can succeed at reducing non-conformances, ensuring compliance across the supply chain, and delivering quality products to the customer.

Some essential recommendations to keep in mind follow:

- Acknowledge that external suppliers are as much a part of your organization as your internal teams. This will facilitate the understanding that your organization can only go so far in terms of its internal quality objectives—those objectives, indeed, need to span the supply chain. You need solutions that flow seamlessly between internal and external systems.
- Internal manufacturing operations and supplier manufacturing operations are not in watertight compartments. They are both intrinsically linked and the symbiotic relationship between the two will be essential for maintaining competitiveness moving forwards. So find a solution that speaks as well to suppliers as it does to internal teams, principally from a standpoint of user adoption and training.
- Many systems within your organization might suffer from a lack of integration. Acknowledge that you need a system that can speak to both current needs and processes, but one that is also scalable in terms of how you plan to build out your manufacturing technology footprint in the future. To address these challenges, consider software solutions that can deliver on both in-house manufacturing operations management requirements as well as more upstream quality requirements for gaining a portal of visibility

The greater the alignment between OEM and supplier, the more individual manufacturers can succeed at reducing non-conformances, ensuring compliance across the supply chain, and delivering quality products to the customer.



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and interaction into supplier activities.

- Understand that, day by day, technology for A&D companies is evolving. Market leaders have leveraged Web-based collaboration and real-time process visibility for years, but the nascent emergence of the Internet of Things (IoT) and Machine to Machine (M2M) communication is beginning to change the game in an enormous way. That is a step ahead of where things are right now, but nonetheless, A&D leaders are understanding where things can go in terms of supplier collaboration and must remain mindful of how these changes will impact the ability to meet regulatory compliance over time.

In the face of sharp regulation, more complex supplier networks, and increasing supplier demand, at its heart, supplier quality has to be viewed as an internal matter. Indeed, within an industry as tightly regulated and scrutinized as A&D, the supply chain has to be viewed as an intrinsic part of the business, and only robust supplier relationship management systems (and the requisite tools) will facilitate this. Those organizations that adopt these capabilities will have a greater view of upstream performance, and will be more equipped to deliver new and better products to market faster in the face of increasing regulatory burdens.

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