Collaborative quality management in aerospace

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Summary

Aerospace quality processes have always been quite specific. However, like processes in supply chain management they are gradually starting to become more of an industry standard. SupplyOn's standardized solutions, well-established in the automotive industry, now support aerospace companies in implementing highly transparent and efficient processes also in the area of quality management. This article describes how the aerospace industry and the automotive industry can learn from each other and thus drive progress in both industries.

Introduction

Since 2012, most major aerospace players in Europe have adopted the unique "AirSupply" community cloud to better collaborate with their business partners in supply chain management. This industry solution uses standard processes within nine companies to collaborate with 1,500 suppliers spanning four levels of the OEM supply chain.

Today, about 5 million new purchase orders are published every year with AirSupply. Every single transaction triggers a structured online collaboration between a customer and one of its suppliers. How was that achieved?

Originally an initiative of the French aerospace association GIFAS in 2009, the project expanded to Europe thanks to a close collaboration with BDLI and other European associations like ASD. In 2011, the joint venture BoostAeroSpace was created by Airbus Group, Dassault Aviation, Safran and Thales to bring this common vision to life. This company serves as an ambassador of the European aerospace industry.

Why federate actors and establish an aerospace solution instead of duplicating existing cross-industry standards? For one, aerospace processes are quite specialized. The chosen approach took the automotive industry as a benchmark and tailored it to the specific needs of aerospace. But that's not all.

The second reason for the setup is that belonging to a community is essential. Aerospace continues to reflect fundamental common values: true cooperation, state-of-the-art technology and no compromises on quality. This code of conduct is a way to demonstrate confidence and at the same time express humility at the complexity of our final product: the aircraft.

Over the years, a true community has gradually joined together around clear leaders. Since 2012, the key influencers have been gathering every year in Toulouse to share best practices in the field of supply chain management.

Initially, AirSupply only addressed core supply chain processes (forecast, purchase order, etc.), but it has become apparent that any activity requiring strong interaction between customers and suppliers can be implemented via the joint SCM platform.

This article will focus on the increasing influence of processes derived from the physical supply chain: the quality of "on-time delivery" measures and the efficiency of "on-quality delivery".

How real is your "on-time delivery"?

Every supplier, even the best in class, has at least once received poor OTD measures from its customer. The reasons are myriad: a quality incident preventing delivery of a part, a machine breakdown on the shop floor, or even a last-minute design change to a critical part by customer engineers.

There is usually a gap between OTD measured from the customer reception docks and what is perceived by the supplier's sales administration. Reducing this gap means exchanging precise information between different departments in both companies. In day-to-day work, this can become quite unstructured.

A collaborative OTD process enables more objectivity and fairness in the measure of supplier performance – to maintain long-term relationships.

This is why Airbus and other companies have implemented a standard "collaborative OTD" process, enabling more objectivity and fairness in the measure of supplier performance. This approach matches both community values and the need to preserve a rather

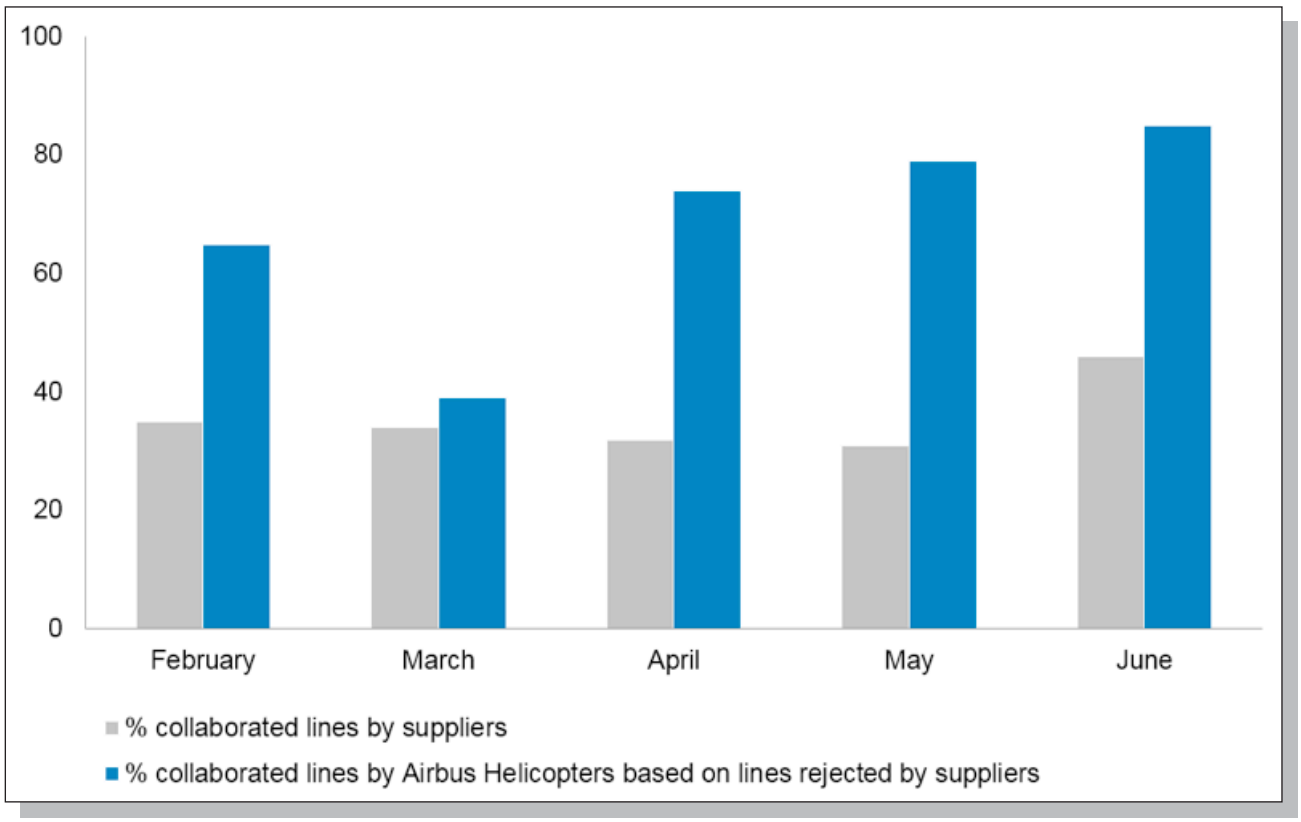

Figure 1: Typical percentage of collaborations on OTD by suppliers and the customer

small supplier panel in aerospace, where long-term relationships are a must do.

The process is rather simple: Any purchase order fully received by the customer is measured in punctuality by comparing the committed date and actual goods receipts dates (all present in the portal). If a delay is noticed, the purchase order line is published and open for collaboration. The supplier can start the collaborative loop and notify if, from his point of view, the line should be considered as "not penalized" or missed because of the customer. Furthermore the supplier enters the root cause. The customer can then respond and arbitrate while also giving a root cause.

Since 2014, Airbus Helicopters has deployed collaborative OTD with suppliers already connected to the AirSupply SCM portal.

Concession Management requires quick and efficient collaboration between production, engineering and quality assurance and prevents disruptive supply chain flow.

Paul Brines, the project manager in charge of the "Collaborative OTD" process at Airbus Helicopters, sees significant benefits in this area: "One of the main benefits for Airbus Helicopters is the ability to integrate a new process into an existing tool as well as having a consistent and fast way to collect, measure and share the data related to supplier performances throughout all Airbus Helicopters departments. Main benefits for the supplier, on the other hand, include the possibility to speak up when late delivery is not their responsibility, with collaboration directly in an existing online tool."

Last but not least, customers and suppliers share mutual benefits. "These include the capitalization of responsibilities and root causes analysis, a faster responsibility allocation and measuring the confidence of the relationship," he says.

Figure 1 shows that the supplier collaborates already on almost 50% of the missed lines – despite the fact of being on a ramp-up phase of the deployment. If the supplier rejects the responsibility, the supply officer at Airbus Helicopters can collaborate on it. Actually, 80% of these lines are further collaborated, showing strong commitment in answering the suppliers.

While collaborative OTD is key to continuous improvement, other processes directly impact the critical path of the supply chain.

Efficiently collaborate on concessions

The "concessions management" (or quality deviations) process (i.e. before a part is shipped) involves numerous departments both on the customer side as well as in supplier organizations. Concessions management is a fairly complex and structured procedure [see Figure 2].

Besides, it requires quick and efficient collaboration between the areas of production, engineering and quality assurance. Because accurate information is needed on technical requirements and actual production data, whilst respecting a strong formalism, the process often strongly relies on human interactions and too many iterations within a specific stretch of time.

But most importantly, concessions induce a breakdown in the supply chain, ultimately preventing a manufactured part from actually being delivered by the supplier. They are therefore disruptive and clearly a critical path within the physical supply chain flow.

For this reason, using the SCM tool to manage concessions is quite natural. Linking a production batch to a purchase order makes it possible to virtually isolate certain parts and start the concessions workflow. Ultimately, delivery of the parts can be directly authorized (or forbidden) online by issuing the release of the part (or preventing the shipment) within in the SCM system.

Quality certificates, templates, pictures and any other kind of document can be uploaded (and downloaded) by suppliers (or customers), therefore minimizing the use of unstructured e-mail exchanges.

Within Safran group, the nacelle manufacturer Aircelle successfully deployed concessions management with their major suppliers in 2014.

Mehdi Benbouzid, from Aircelle's Suppliers Quality department, explains the most significant customer benefits: "We used to receive the concessions request from suppliers by e-mail. We had to retype all information in our quality system within SAP and then transfer this concession to our engineering department. Today, the supplier only types the concession into the portal; it is then automatically integrated into SAP. The Engineering team receives a pop-up that a new concession is to be reviewed. We save a lot of time assuming that receiving 30 concessions per day is not unusual." Suppliers, on the other hand, "welcome the reduction in the number of portals they work on. This brings economies of scale."

Finally, both supplier and customer benefit from an overall reactivity that occurs in "almost real time" when it comes to approving (or. challenging) a concession request.

Continuously improving industry performance

In 2013 under the leadership of QUALIFAS, members of the French aerospace industry started to share best practices in the field of performance monitoring. The objective was to standardize the method of supplier performance assessment in the industry. Why was this necessary?

For one, aerospace is rather "small" compared to automotive and also rather compact, due to the leading role Airbus plays. In 2011, 500,000 people worked for aerospace in Europe1) compared with 12 million for automotive2) – a full 20 times more.

Secondly, most TIER-2 suppliers cater to the same TIER-1 customers, which all supply to the same OEM. Every single TIER-1 had their own way to measure supplier quality and punctuality performance, which sometimes led to consistency gaps.

Looking at the big picture, the entire performance of the

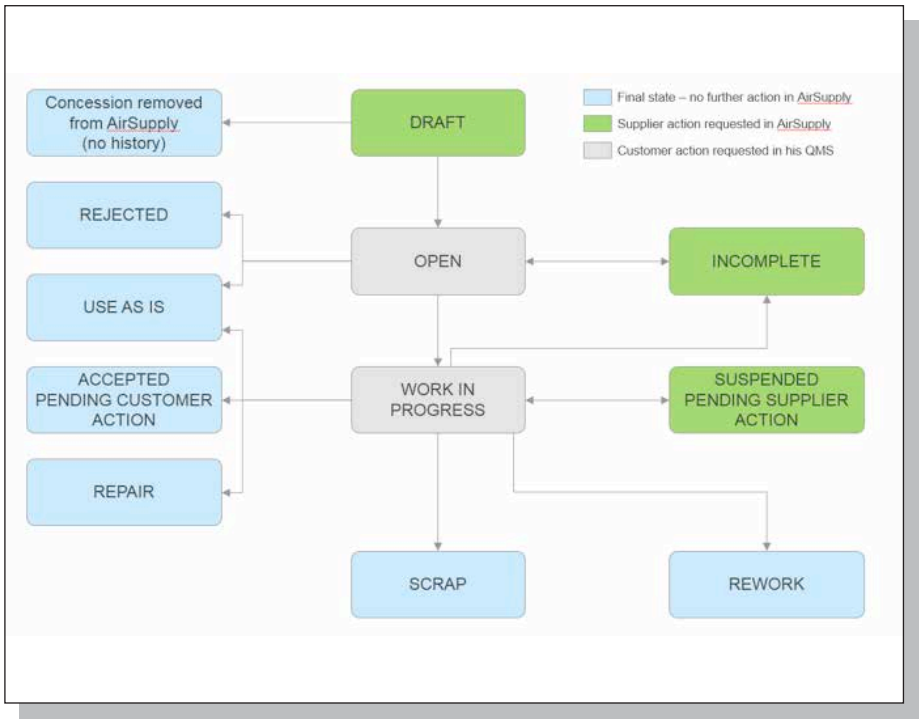

Figure 2: Overview of concessions management process and expected outputs

aerospace supply chain could be consolidated from TIER-1 to TIER-N, enabling a robust risk-management approach. This is yet another reason why it was critical that the industry association took the initiative and made possible for different voices to be heard in the community: to maintain objectivity and fairness in the standardization.

Since 2014, the OTD measure has been standardized in IAQG (International Aerospace Quality Group), enabling more consistency when different customers assess punctuality of the same supplier. The delay average, useful and complementary to the OTD, was also standardized.

In terms of quality topics, standardization has now also been achieved for "ppm" calculation (i.e. "item escape rate") and concessions rate. These four indicators have been brought together in the supplier scorecard. Interestingly enough, all these KPIs can be flagged as "collaborative" [see Figure 4]

Even if the application of this kind of standard is always based on the free will of customers, it is undeniable that suppliers will benefit from streamlining the assessment of their performance. Initial implementations are planned as soon as 2016.

Looking beyond: benchmark automotive and aerospace

Aerospace processes have always been specific. However, they are gradually starting to become more standard.

In the field of quality, Airbus had deployed standard "8D analysis" for years to investigate causes and follow-up action plans for quality incidents. There are very few differences between standard automotive 8D and aerospace 8D. Besides, the root cause analysis diagrams such as the Ishikawa fish-bone diagram are a true cross-industry standard. This is yet another example of cross-industry convergence.

Quite naturally, Airbus Helicopters decided in 2015 to deploy the automotive quality claims management solution directly linked to its ERP. The objective remains to collaborate with suppliers on the same portal as the one used to receive purchase orders. A full end-to-end "purchase to pay" process including e-invoicing could enter into service in the near future.

Finally, it is often assumed that aerospace is constantly adopting ideas and best practices from automotive. And yes, this is usually true, due to the continuous need for higher ramp-ups of aircraft. But that is not always the case.

It also goes the other direction: These days, all car manufacturers are engaged in a real "weight hunt" to satisfy increasingly stringent environmental emissions rulings. This is now the same for mass-production vehicles. Therefore, composites technology (especially carbon fiber), previously mostly reserved to aerospace and exclusive high-end car OEMs is now widely used by mainstream manufacturers. 3)

And in return, aerospace will benefit from automotive raw material volumes purchasing, process innovation and tools enhancements like robots and more. 4)

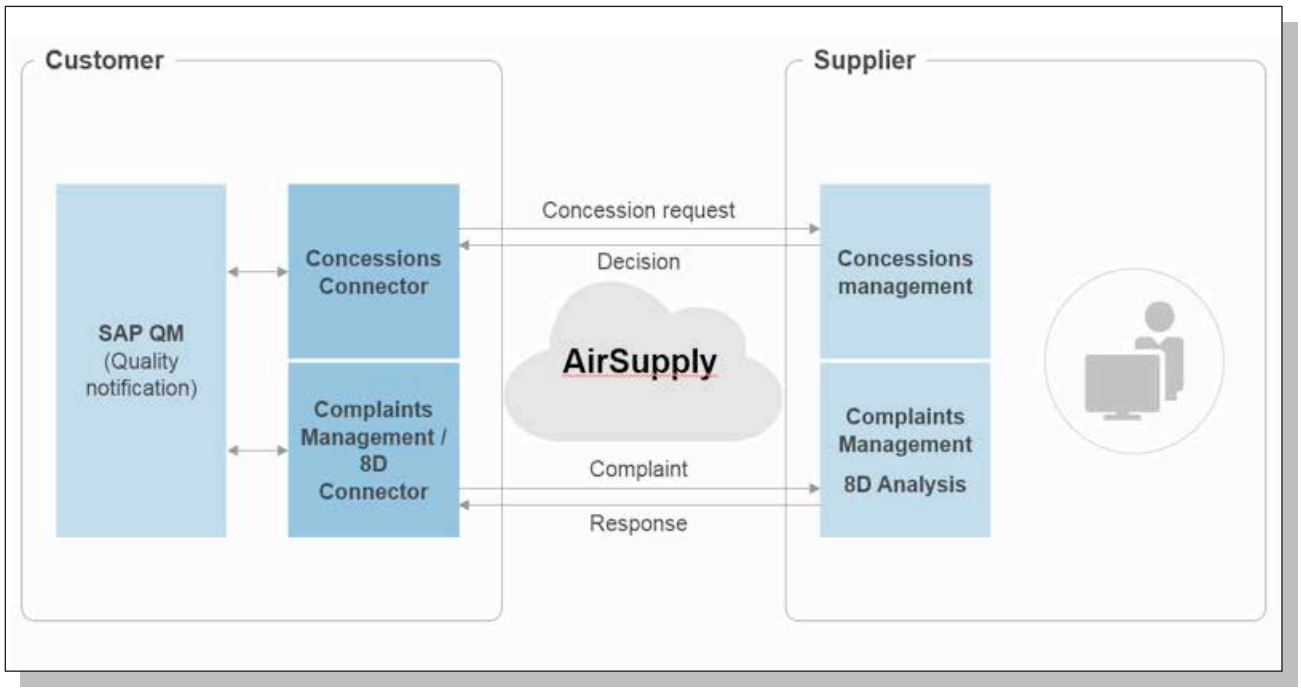

Figure 3: Shared platform to handle concessions efficiently on both sides of the supply chain

This has sparked a truly virtuous circle that will drastically drive progress in both industries.

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Zusammenfassung

Qualitätsmanagement-Prozesse in der Aerospace-Industrie waren bislang sehr individuell, entwickeln sich derzeit jedoch immer mehr in Richtung eines gemeinsamen Industrie-Standards. Hierbei leisten die standardisierten Lösungen von SupplyOn, die seit langem in der Automobilindustrie etabliert sind, einen wichtigen Beitrag. Sie unterstützen Aerospace-Unternehmen bei der Einführung transparenter und effizienter Qualitätsmanagement-Prozesse in der Zusammenarbeit mit Lieferanten, wie zum Beispiel Reklamations- und Concession-Management-Prozesse sowie Prozesse zur Steigerung der Liefertreue. Der Artikel beschreibt anhand konkreter Beispiele aus der Praxis, wie beide Industrien im Sinne einer kontinuierlichen Verbesserung in hohem Maße voneinander lernen und profitieren können.

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LAURENT MARTIN-ROHMER, born in 1974, is an engineer at ISAE-SUPAERO. He has 15 years of experience as an Aerospace Industry Manager, consulting in supply chain optimization. Initially A380 Purchasing Manager for Aircelle (Safran Group), he then managed 15 intensive cost optimization projects in supply chain and engineering for clients in aerospace, automotive, nuclear and train industry. He joined BoostAeroSpace in 2012 as AirSupply Product Manager. He then became accountable for Sales and Marketing at BoostAeroSpace. Since 2015, he has been based in Munich as Sales Manager for SupplyOn AG, in charge of France.

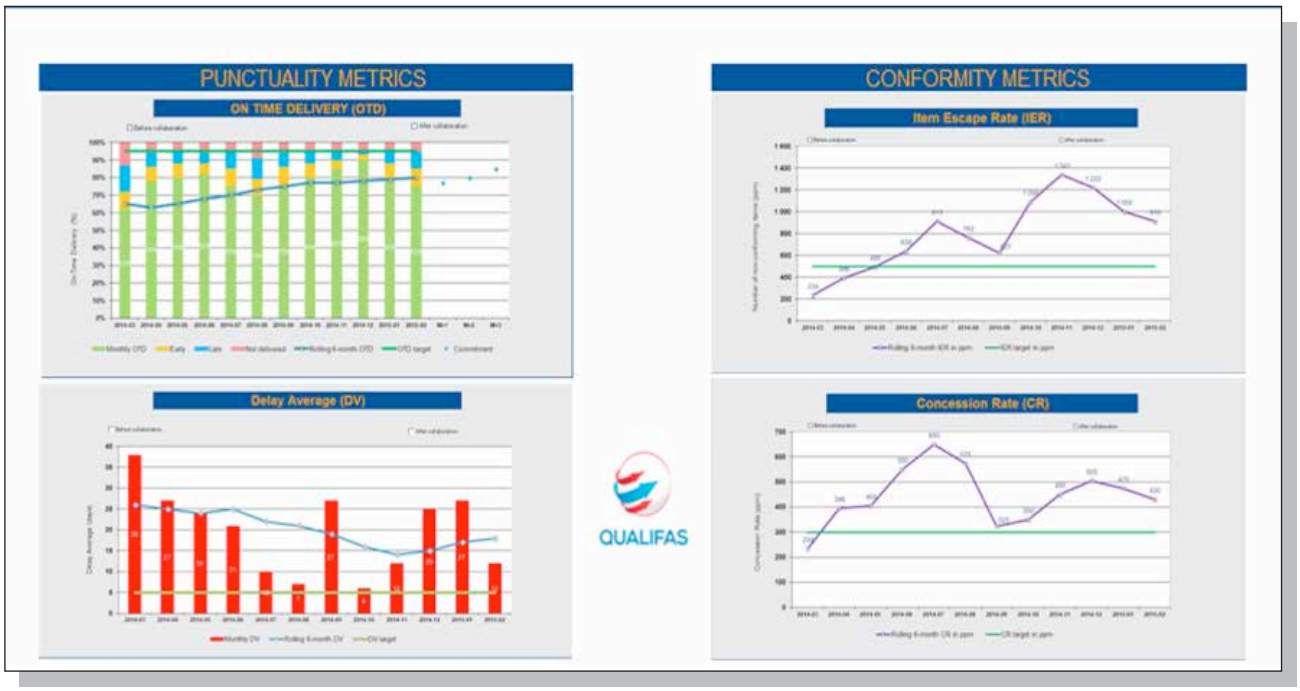

Figure 4: The template of the aerospace supplier scorecard