

# Managing Complex Aerospace Supply Chain Networks

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## Summary

The ongoing digitalization of all stages of the supply chain is one of the most important transformations that will help master future challenges in the aerospace industry, according to a new study of the aerospace supply chain whose key findings are summarized in the following article. While collaboration between OEMs and top-tier suppliers is already digitalized to a large extent, this mostly concerns handling conventional order processes. If other supplier-related processes are considered (handling complaints, action management and so on), the picture is completely different. Many companies want greater digitalization in these areas, both in relation to the customer and the supplier. And the closer to the start of the supply chain, the more often unstructured processes involving faxes, e-mails and Excel are encountered. The three biggest roadblocks on the path to greater digitalization – and this is particularly true when it comes to integrating SMEs – are the lack of preconfigured interfaces, insufficient standards for processes and scarce standards for IT tools. The need to take action is significant here. But so, too, is the opportunity to achieve major improvements and savings if agreement could be reached on standards.

## Digitalization of the supply chain – the current situation

While digitalizing the supply chain is certainly making headway, there is still considerable potential to be tapped. A glance at the figures indicating which business partners – customers or suppliers – already digitally collaborate underscores this.

Only around one-quarter of the companies surveyed (28 percent) have extensively digitalized both their inbound and outbound supply chains. Around one-third (31 percent) are still primarily working by fax, phone and e-mail in both directions – that is, with customers as well as suppliers. Just under one-half of the companies (41 percent) have digitalized processes with customers, but with suppliers they are still organized using faxes, e-mails and phoning. This focus on the customer interface is certainly due to the extensive digitalization efforts of OEMs and system suppliers.



Figure 1: Digitalization of the supply chain is on the rise. What is the situation at your company?

The desire for greater integration in both directions is very pronounced, however. In one reflection of this, almost 90 percent of respondents said they wanted even closer integration into their customers' processes. And around three-quarters of respondents indicated they believed they would benefit from closer integration with their suppliers.

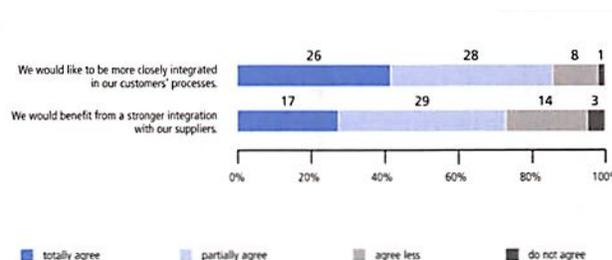


Figure 2: Desire for stronger integration

But greater digitalization, which the majority of respondents support, is only possible when certain conditions are met. At the top of the list is comprehensive data protection, which all respondents almost without exception considered important. Maintaining costs within certain limits was regarded as the second most important issue, especially for small and medium-sized enterprises (SMEs). Large corporations can manage major investments and running costs since these expenses are also offset by considerable savings from process optimizations. This lever does not, however, help SMEs to the same extent because the benefits generated by process improvements are naturally on a smaller scale. It is crucial that costs not wipe out the resulting savings. This is where providers of supply chain platforms need to adapt their fee models to reflect the real savings achieved by SMEs.

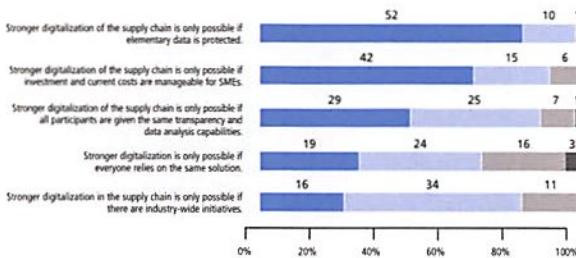


Figure 3: Prerequisites for stronger digitalization

Fair play and achieving a level playing field for all participants was the third most important requirement. SMEs would agree to more comprehensive digitalization only if all participants got to enjoy the same transparency and ability to analyze data.

And these last two aspects are not unimportant: on one hand, the demand is that everyone counts on the same solution, while on the other, industry-wide initiatives are required. The variety of solutions being used today undermines the advantages of digital process handling, the study highlighted elsewhere. High administrative overhead has been the result, and this has

**Solid and consistent information management that draws strictly from data is not feasible without further digitalization in complex supply chains.**

been out of all proportion to the benefits of the solutions, particularly in the case of smaller companies. The demand for industry-wide initiatives has been heading in a similar direction. It, too, would imply use of a

shared solution tailored to the needs of the aerospace industry.

**Degree of digitalization in supply chain processes**

Important supply chain processes such as forecasting, purchase orders, dispatch advice, invoicing, vendor-managed inventory, OTD collaboration, nonconformance and action tracking were examined. The study revealed that only around 20 percent of respondents saw no further added value in digitalizing these processes, while around 50 percent said they wanted to actively press ahead with this work. Because digitalization's benefits rise exponentially for all participants to the extent of its use, this gratifyingly high potential should be tapped now and also to the advantage of those who already extensively employ digitalization – a group that comprised around 10 percent of those surveyed.

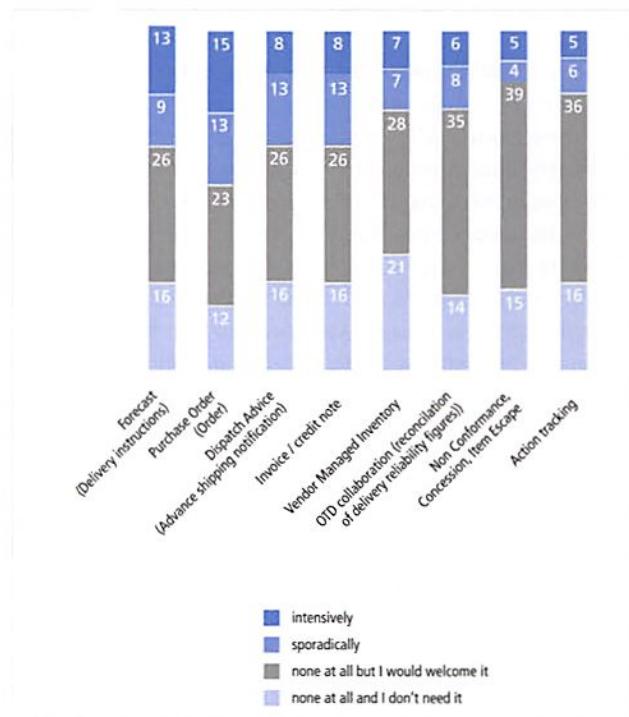


Figure 4: Which processes do you already manage with your suppliers using a shared electronic tool?

Some obstacles on the path to greater digitalization of supplier processes have been blocking the way, however. The three main sticking points identified included the lack of preconfigured interfaces to internal systems, insufficient standards for processes and scarce standards for IT tools. Around two-thirds of respondents regard these problems as major or at least very significant.

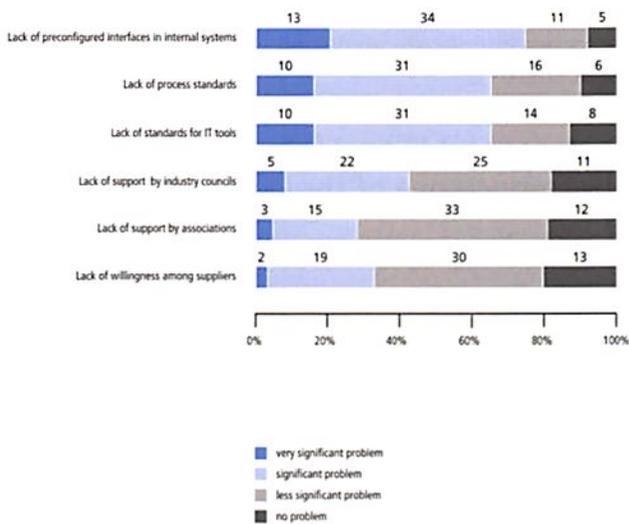


Figure 5: What do you see as the biggest problems regarding the integration with your suppliers?

### Diversity of system landscapes

Just under 90 percent of respondents expressed the opinion that the variety of existing portals and solutions destroys the benefits of electronic process handling – but this is actually the reality: 80 percent of the companies surveyed work with their customers using individual portals.

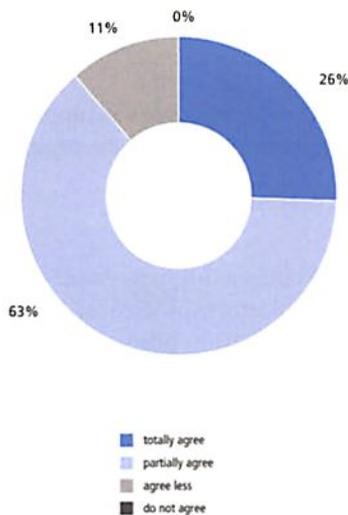


Figure 6: Is the diversity of existing portals nullifying the advantages of electronic process management?

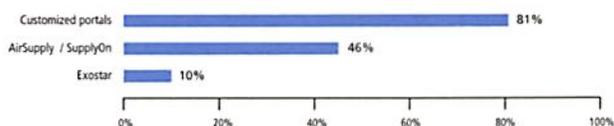


Figure 7: Which portals and platforms do you use?

There is an urgent need to take action and reach agreement on standardized processes and solutions that everyone would use. This would reduce administrative overhead as well as generate cost benefits for everyone. This is the only way to also reach smaller companies whose greatest obstacle to digitalization is the lack of standards for processes and for IT tools.

This is also true across the industry, however: because technology-driven, specialized small companies frequently serve different sectors with their products and solutions, they benefit from a standardized platform that is not only tailored to the aerospace industry but also encompasses other sectors such as automotive, railway, manufacturing and so on.

### Challenges: what will be the focus in the next five years?

As expected, rising cost pressure was cited most by the companies surveyed when asked what the most significant challenges would be in the coming five years. Nearly 90 percent of respondents viewed this as a significant or highly significant challenge. A general trend in industry, cost pressure is particularly pronounced in the aerospace sector as it is also experiencing a shift away from a strategic-political mindset toward a greater focus on costs.

The basic rule of successful supply chain management – “information flow comes before material flow” – emerged as the second greatest challenge. Around 80 percent of respondents agreed with the statement that the requirements for quality and timeliness in the information flow would increase in the next five years. This was followed closely by increasing customer expectations with respect to assuming risks, rising complexity owing to configuration diversity, growing requirements in relation to cash management and last-minute changes to agreed delivery dates.

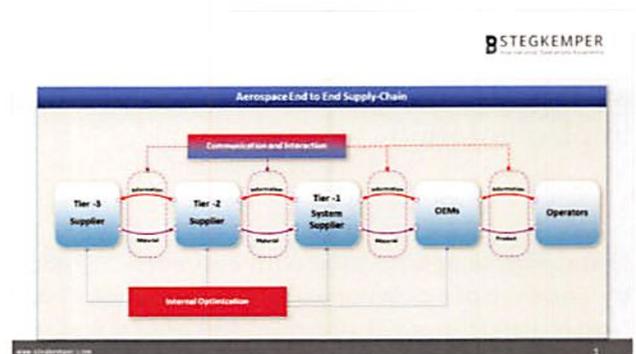


Figure 8: Information flow comes before material flow

### Effective action: what should be done?

More closely integrating with customers was unanimously viewed as the most effective action to take to counter the challenges of the next five years. Greater integration with suppliers was a close second.

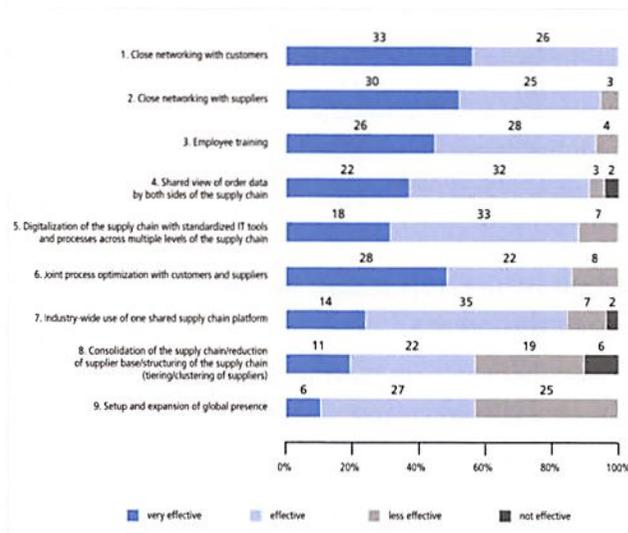


Figure 9: How effective do you view the following actions in meeting future challenges?

The actions rated as third to seventh most important directly relate to the first two actions because they also focus on intensifying customer and supplier relationships and making these more efficient. Rated nearly as highly as the first two, these actions can be regarded as almost as important. “A shared view of order data,”

Risks that frequently arise due to delayed, incomplete or incorrect data are identified earlier and can be dealt with effectively.

### Systems and IT tools are not everything: the importance of the human factor

Generating shared, current and relevant data is only a first key step. An important point to remember here is this: the more comprehensive the end-to-end pool of data – that is, from all key participants from one end of the supply chain to the other – the greater the potential benefits for all those involved.

The resulting information is networked intelligently and can in turn be condensed into specific knowledge. This knowledge forms the basis for creating such mission-critical capabilities as fully integrated planning, effective risk management and a continuous improvement process.

Practiced, improved and new capabilities increase competitiveness – after all, added value can only be achieved in the end through a broadly applied system of improvement.

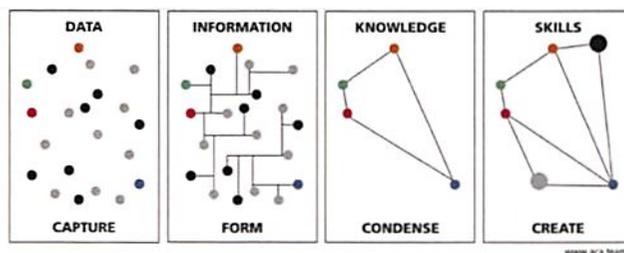


Figure 10: How complex aerospace supply chains can be captured and digitally depicted

### Implementing new, integrative and digital models on a company-wide basis is only possible when people are involved and input is received from all experts and those who can carry out the implementation

“joint process optimization with customers,” “industry-wide use of a common supply chain platform” and “use of standardized IT processes and tools across several stages of the supply chain” all essentially relate to the same thing: optimization of the interfaces within the supply chain. There is obviously an urgent need to take action here. Collaboration platforms offer the basis for tackling the obvious need to improve management processes. They help build trust through jointly created and shared data. Resources are used less for discussing errors and causes and more for resolving problems.

While a high-performance collaboration platform is critical for enabling this collaboration process, limiting the approach to a technical solution is by no means adequate. Implementing new, integrative and digital models on a company-wide basis is only possible when people are involved and input is received from all experts and those who can carry out the implementation.

The aerospace industry has already demonstrated many times that it can do this. Flight guidance and management systems have achieved an incredibly high level of digitalization, enabling higher quality and much greater efficiency in the delivery of services. These human-machine interfaces were not developed in an ivory tower, but rather as part of the evolutionary process of closely collaborating with users. These systems provide an exceptional interactive experience that lets users apply their intuition, know-how and skills not

only during normal operation but also in unforeseen circumstances.

## Potential for the aerospace supply chain: conclusion and outlook

An efficient global division of labor is increasingly shaping the aerospace supply chain; and in the future, the processes and methods involved will more intensively leverage the opportunities offered by digitalization. This trend involves all companies being highly integrated along the entire supply chain. Comprehensive digitalization of the supply chain – as shown quite clearly by this study – is urgently needed. It can, however, only be achieved with innovative, standardized processes and collaborative IT tools.

In addition to offering innovative products and excellent services, successful business models in the aerospace industry rely on an optimized synchronization of all company divisions on the basis of the S&OP process. The necessary integrated planning and control of demand (based on forecasts and received orders) and the delivery ability (based on operational expertise) demand relevant, timely, correct and uniform data to support both internal and cross-company decision-making processes. This is also true for ensuring a rapid response to risks and opportunities. Solid and consistent information management drawing on a stringent data basis is not feasible without further digitalization of complex supply chains.

OEMs place rigorous demands on integration-ready and complete data for managing an efficient, agile and stable Supply Chain. The top tier should assume a moderator role for SMEs so the complexity of the supply chain is reduced to a manageable size. This demands having both higher performance interfaces between the IT systems and interfaces developed using a practical, hands-on approach and integrated seamlessly into business processes. SMEs require standards to avoid foundering under the weight of complexity in the designations, processes and diversity of digital solutions.

Now is the time for defining concrete approaches to solutions or using existing approaches systematically and consistently. Companies, associations and political leaders are called upon in equal measure to accomplish this. The Supply Chain Excellence Initiative and the shared desire to strengthen cooperation can make a significant contribution here – and in the process promote the global competitiveness of German aerospace.

## Zusammenfassung

*Die weitere Digitalisierung der Supply Chain über alle Stufen der Lieferkette hinweg ist eine der wichtigsten Maßnahmen, um die zukünftigen Herausforderungen in der Aerospace-Industrie zu meistern. Dies ist eines der Ergebnisse einer aktuel-*