Successful Management of Aerospace Supply Chain Networks
Challenges and Solutions

STEGKEMPER
International Operations Excellence

FURTHER INFORMATION ABOUT THE DIGITALIZATION OF THE AEROSPACE SUPPLY CHAIN

Supply Chain Excellence Initiative
www.german-aerospace.de (only available in german)

SCM Training der Supply Chain Excellence Initiative
www.bavairia.net/dienstleistungen/fachveranstaltungen/seminare-und-workshops/scm-training/
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BoostAerospace – AirSupply
www.boostaerospace.com/airsupply/

Legal notice
Stegkemper GmbH
Bert Stegkemper
Krebsgarten 1, 86609 Donauwörth
Tel. +49 906 99 99 16 07
info@stegkemper.com, www.stegkemper.com

Responsible
Bert Stegkemper, Geschäftsführer

Project management and editing
Cornelia Staib, Manager Communications
Cornelia.Staib@SupplyOn.com

Design
TINEVONTEIN | GRAFIKDESIGN
www.tinevontein.de

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EXECUTIVE SUMMARY

The results of the present study clearly indicate that the ongoing digitalization across all levels of the supply chain is one of the most important actions that will help meet future challenges in the aerospace industry.

While collaboration between OEMs and top-tier suppliers is already digitalized to a large extent, this only concerns the handling of conventional order processes. If other supplier-related processes are considered, such as advance shipping notification, action tracking, or reconciling delivery reliability figures, the picture is completely different. Many companies would welcome greater digitalization and handling through use of a shared tool – on both the customer side and the supplier side. And the earlier in the supply chain, the more often unstructured processes involving faxes, e-mails and Excel are encountered – coupled with the desire for greater digitalization of the supply chain processes.

However, in order to make digitalization a reality on even the initial levels of the supply chain, certain general conditions need to be met:

- Investments and current costs must be sustainable – in other words, lower than the savings that can be achieved with digitalization.
- A high level of data protection must be ensured.
- The principle of fair dealings must apply: All participants must benefit from the transparency and opportunities of the data analysis.
- One and the same solution must be used industry-wide.

The three biggest obstacles for the integration of suppliers are considered to be the lack of pre-configured interfaces, insufficient standards for processes and the lack of standards for IT tools. As a first step, supplier associations are called on to support the definition of standards that apply throughout the industry. In a second step, these standards must be implemented and used by the industry – in particular by large OEMs and top-tier companies.

Although the call for standardized processes and IT tools is loud and clear, the actual situation looks much different: Diversity is the dominating characteristic when it comes to both internal ERP systems and the platforms and portals used: Even here, it hasn‘t been possible to use one system industry-wide, and it‘s a similar picture with platforms and portals for cross-company collaboration – and this despite the finding that the variety of systems and platforms is what actually defeats the benefits to a certain degree. The need to take action is significant here – so too is the opportunity to achieve major improvements and savings if agreements could be reached regarding standards.

STUDY DESIGN

The present study was prepared as part of the „Supply Chain Excellence (SCE) Initiative“, an initiative of the regional aerospace associations and clusters with the support of the Federal Association of German Aerospace Industry (Bundesverband der deutschen Luftfahrt-Industrie - BDLI) and SPACE Deutschland. The goal of the initiative is to support companies from the aerospace supply industry during structural changes, thereby improving their overall global competitiveness.

It is divided into the following six workstreams:

- Business models
- Internationalization
- Industrial Performance
- Financing & Contracts
- Sales & Operations Planning
- Cooperation Projects

The workstream relevant for this study, Sales & Operations Planning, focuses on the digital infrastructure as well as complex challenges in the information and material flow within global aerospace delivery chains.

The goal of the study is to gain a clear picture of the current status and future challenges with regard to the digitalization of the supply chain – from the perspective of the suppliers. They were the target group of the survey and, as such, were invited to participate by their respective regional associations.

In the first question block, the current situation was examined with regard to digitalization of the supply chain: To what extent is the supply chain already digitalized – on both the customer side and the supplier side – and what conditions must be met in order to further digitalize the supply chain? In addition, the degree of digitalization was examined on an individual process level in order to provide a detailed picture of which processes have accumulated needs.

The next question block examined obstacles that are impeding a stronger integration of suppliers and thus expansion of the digitalized supply chain. Are these hurdles of a more technical nature or do companies feel they are inadequately supported by associations and the industry? Or is digitalization still lagging behind due to a lack of supplier willingness?

The following section focused on the role of IT tools in the comprehensive digitalization of business processes and the associated demands placed on IT.

The last section of the survey examined the question of what the challenges will look like in the next five years and which measures are considered most effective for meeting these challenges.

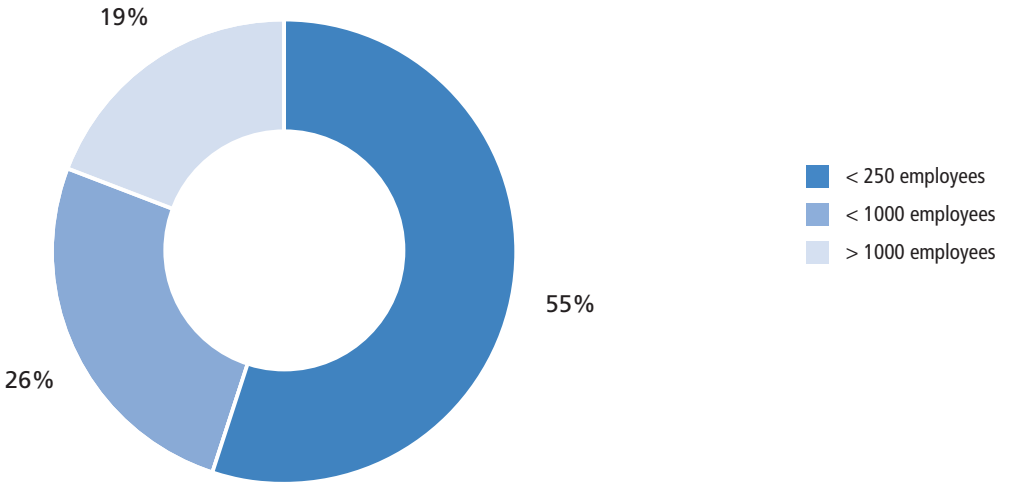
The findings of the study are intended to provide the participants of the SCE initiative valuable information regarding which areas require action and where targeted support by (regional) associations and the industry is needed.

STATISTICAL DATA

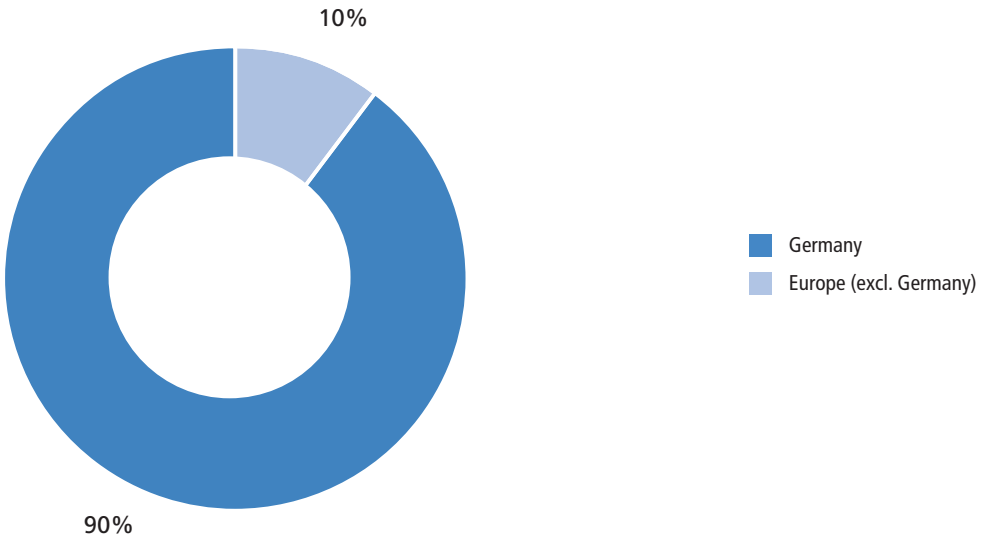
The data included in the present study were collected in the spring of 2016 by means of an anonymous online survey. The electronic questionnaire was fully completed by approximately 60 respondents, which corresponds to a response rate of 10 percent. The target group of the survey was decision-makers from the fields of supply chain management and logistics of the German aerospace supply industry.

The companies surveyed primarily represent small and medium-sized suppliers: More than 80 percent of them have fewer than 1,000 employees, some two-thirds of them even have fewer than 250. 90 percent of the companies are based in Germany, 10 percent are headquartered throughout the rest of Europe.

How many employees does your company have?

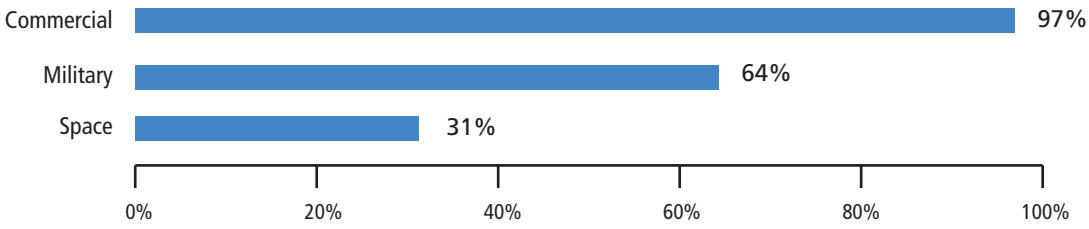


Where is your company's headquarters?



Almost all of the companies surveyed manufacture parts for the commercial aviation industry, two-thirds of them also for military purposes. Only one-third of them also manufacture for the space industry.

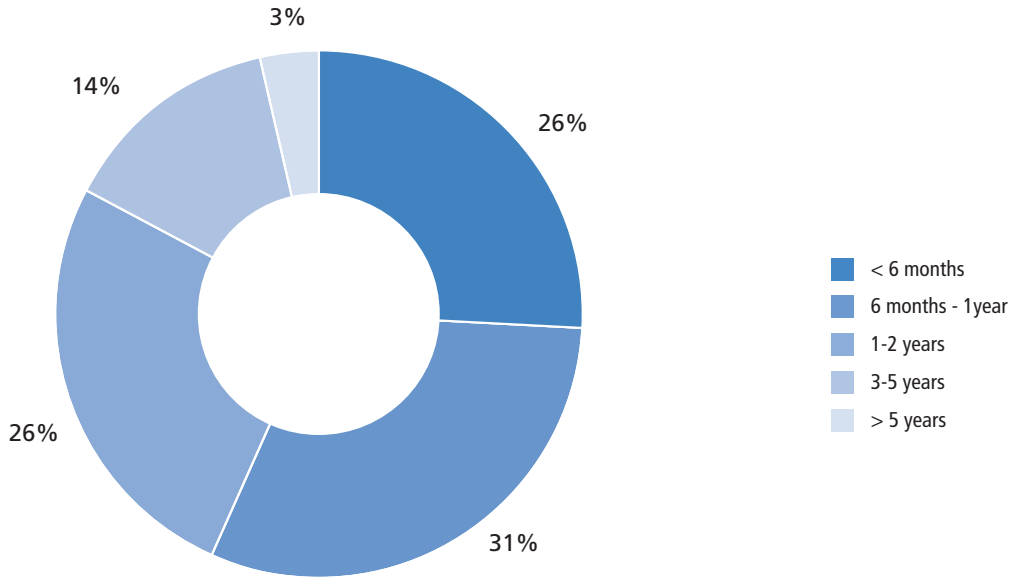
In which areas of the aerospace industry is your company active? (Multiple answers possible)



The question about the time horizon covered by the current order volume revealed striking and surprising information regarding the short-term nature of filling order books. For approximately one-quarter of the companies, the order volume covers the next six months maximum. While far more than half of the companies (57 percent) have orders that extend for one year maximum. Only 17 percent reported orders covering the next three years or longer.

This picture is concerning, given the fact that innovations are generally associated with high investment, and the short time horizon of the current order volume makes investment difficult, possibly even preventing it. A more long-term purchasing strategy by the OEMs could be helpful for promoting innovation.

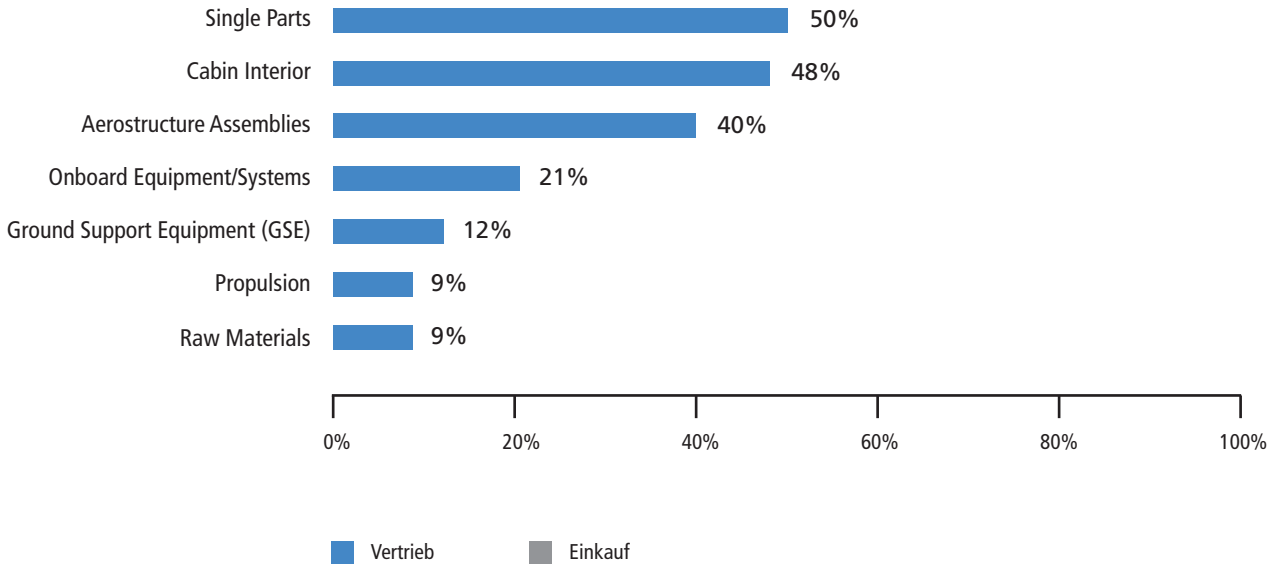
What time horizon does your current order volume cover?



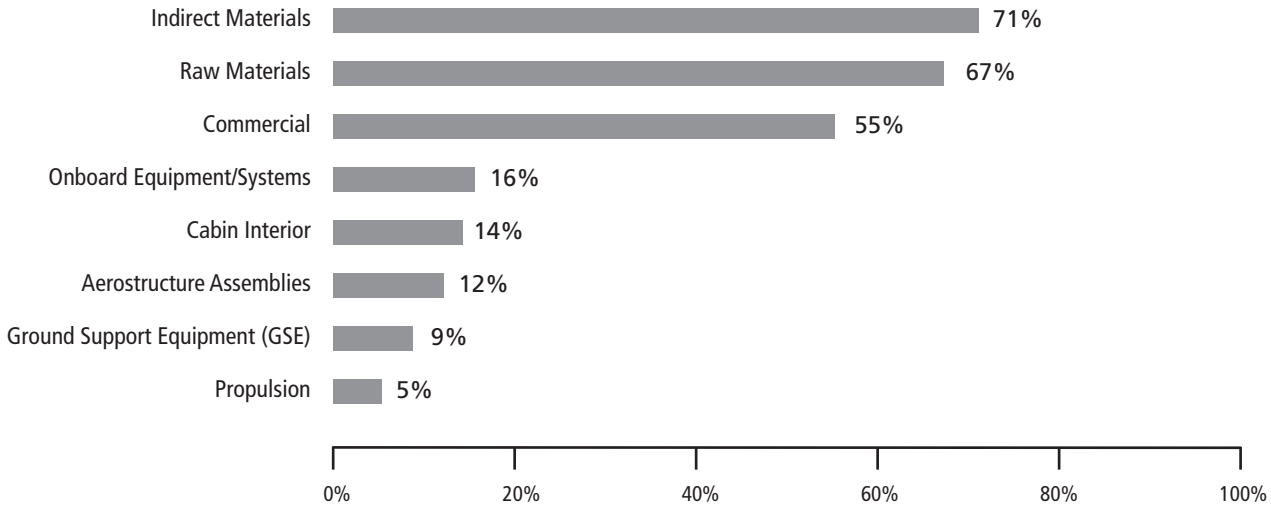
PURCHASING AND SALES: WHAT, WHERE TO AND WHERE FROM?

Findings from the two questions about what parts the companies purchase and what they supply are less surprising. The German aerospace supply industry is traditionally leading in the single parts (50 percent), interior cabin fittings (48 percent) and structural assemblies (40 percent) segments.

What does your company supply/produce? (Multiple answers possible)



What does your company purchase? (Multiple answers possible)

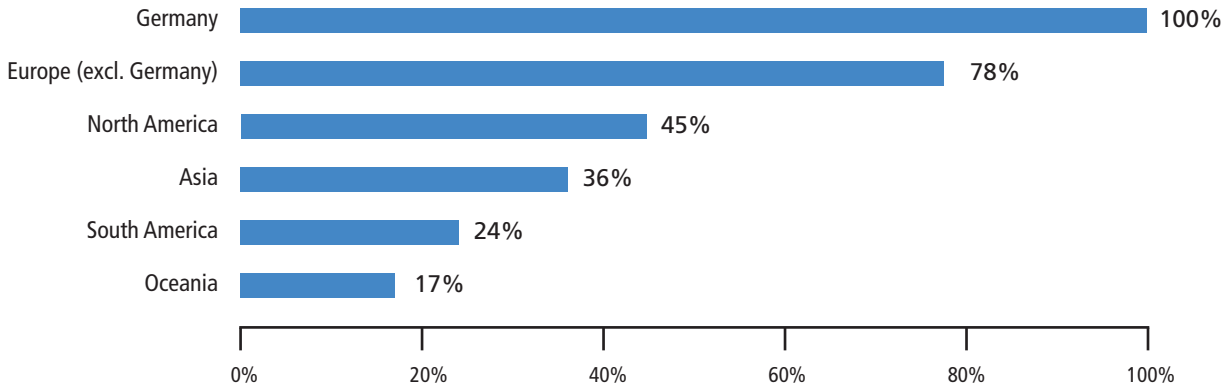


By contrast, the degree of global activity on the part of the companies surveyed and based in Germany is striking in terms of purchasing and sales: Almost half of the companies surveyed supply parts to North America and purchase there as well; approximately one-third of the companies do the same in the Asian market.

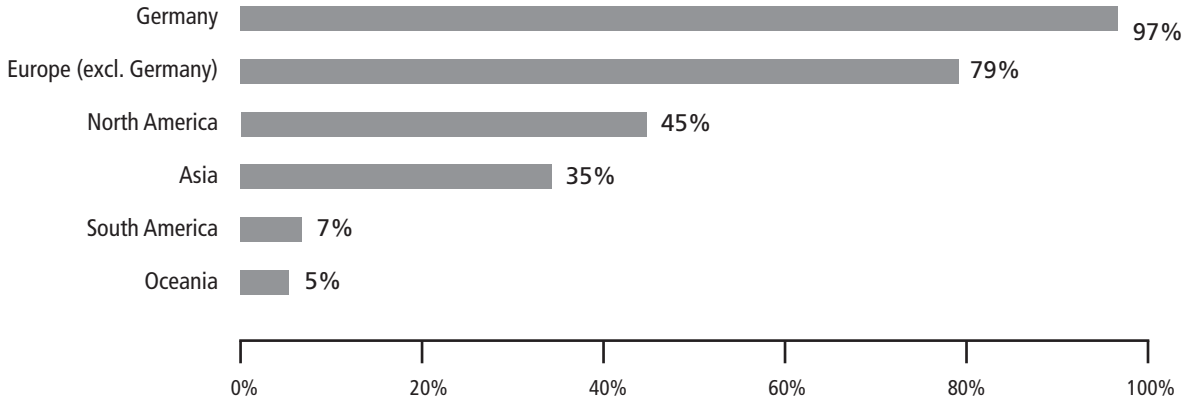
South America also appears to be an important market for these companies, at least in terms of sales. After all, one-quarter of the companies supply customers in this region. Even Oceania is not an insignificant market with 17 percent.

However, these two markets are less significant for purchasing: Lower percentages of 7 percent (South America) and 5 percent (Oceania) were reported here.

In which regions do you supply your products? (Multiple answers possible)



Which regions do you purchase from? (Multiple answers possible)



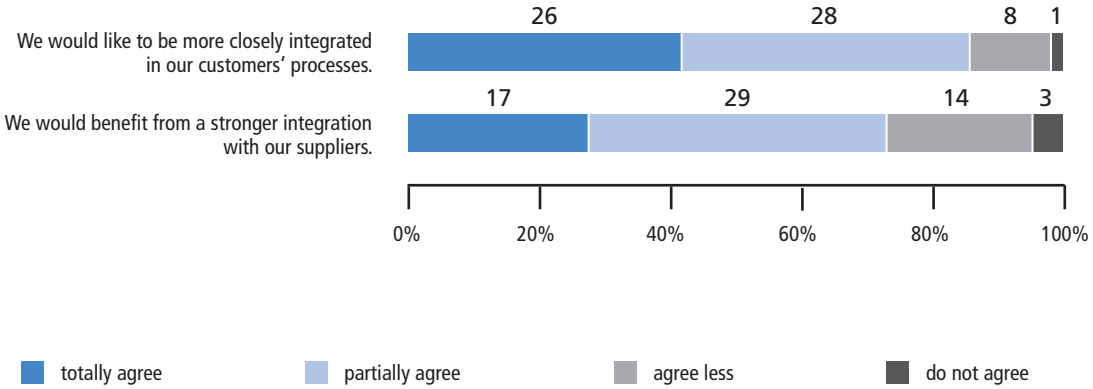
DIGITALIZATION OF THE SUPPLY CHAIN – CURRENT SITUATION

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 primarily working by fax, phone and e-mail in both directions – that is, with customers as well as suppliers. Almost half 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.

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

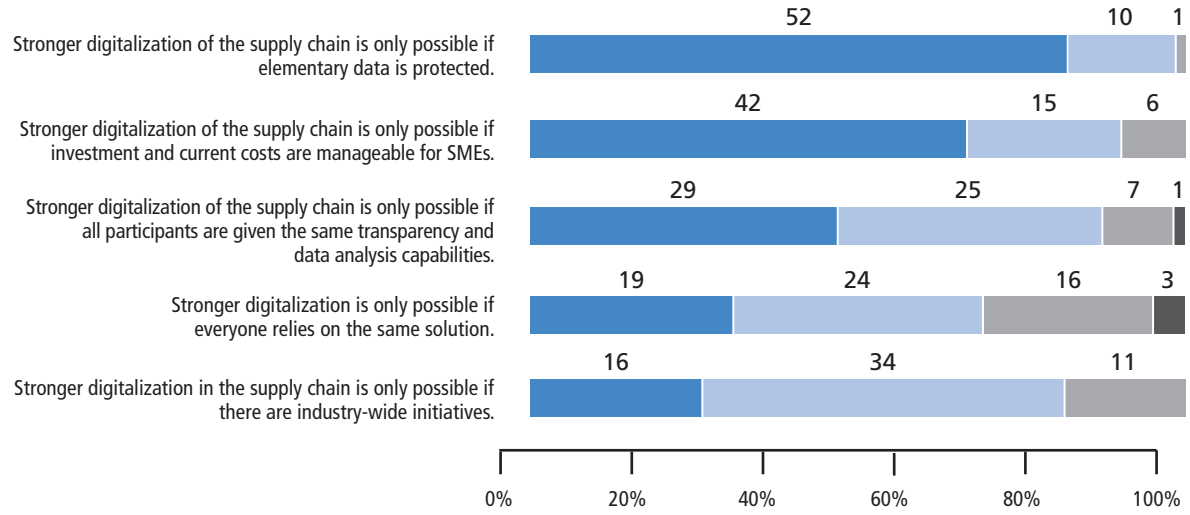
However, the desire for greater integration in both directions is very pronounced, as this diagram illustrates. For example, almost 90 percent of respondents said they wanted an even closer integration into their customers' processes. And around three-quarters of respondents indicated they believed they would benefit from closer integration with their suppliers.



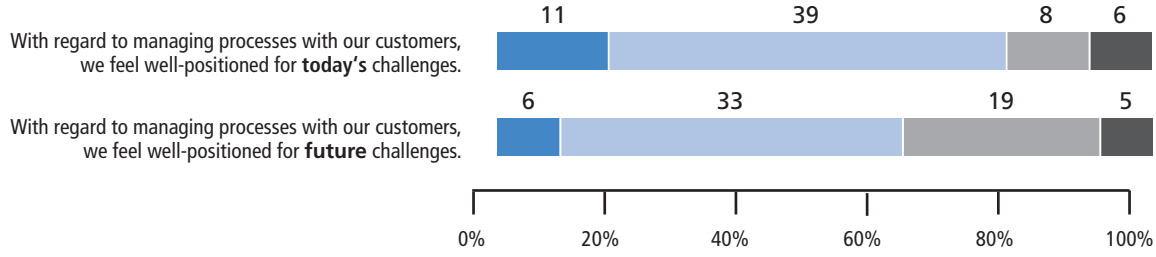
However, greater digitalization, which the majority of respondents support, is only possible when certain conditions are met. At the top of the list is comprehensive data protection, which all respondents almost without exception considered important. Furthermore, costs, especially for small and medium-sized enterprises (SMEs), must be kept to a reasonable limit. 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 do 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.

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 had the same level of transparency and ability to analyze data at their disposal.

These last two aspects are not insignificant: On one hand, the demand is that everyone count on the same solution, while on the other, industry-wide initiatives have to exist. The variety of solutions being used today undermines the advantages of digital process handling, the study highlighted elsewhere (see p. 16). High administrative overhead has been the result, and this has 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 the use of a shared solution tailored to the needs of the aerospace industry.



On the question about how well-positioned companies feel regarding process management with their customers, both now and in the future, assessments do not widely differ – but one trend is noticeable: it does not look very positive for future challenges. Action needs to be taken now in order to impede this trend.



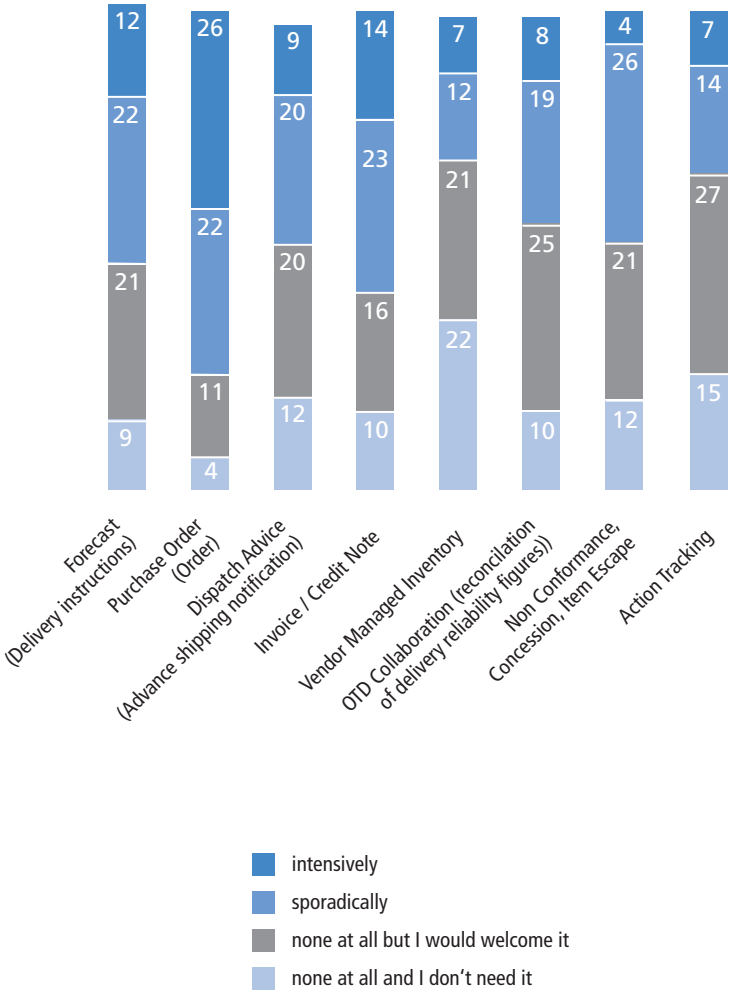
DEGREE OF DIGITALIZATION IN SUPPLY CHAIN PROCESSES

The next question block looked at individual process levels to determine which supply chain processes are managed via portals/platforms and to what degree – on both the customer side and supplier side.

In the processes with customers, it is less surprising that the degree of digitalization is especially high in the order process. However, this appears to be used by companies only sporadically. While consistent use of this on the customer side could lead to noticeable process savings for both sides without a great deal of effort.

Significantly more than one-third of those surveyed would welcome assistance from a tool to track actions and reconcile delivery reliability figures. This is based on the desire for greater transparency and traceability, for instance when tracking arranged actions or when assessing a possibly unjust delivery performance.

Which processes do you currently manage with your customers using a shared electronic tool (portal/platform)?

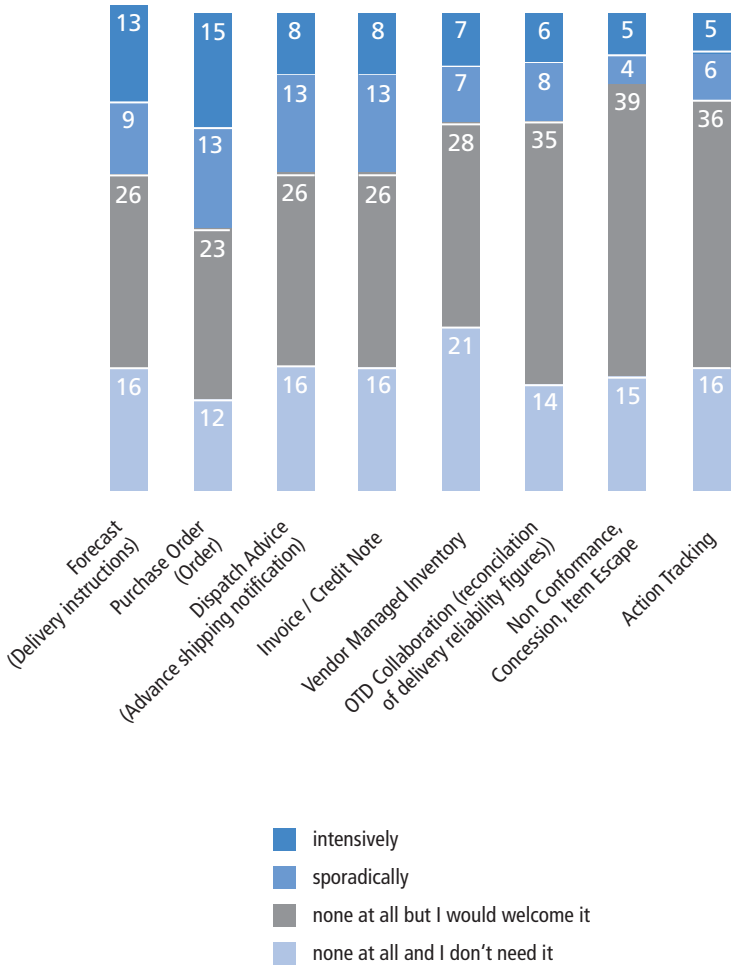


The fact that the degree of digitalization for inbound processes is much lower compared to outbound processes for SMEs, which represent the majority of companies surveyed, is not surprising; while the distinct desire for stronger digitalization is noteworthy: Significantly more than half of those surveyed would welcome the assistance of a tool, particularly for OTD collaboration, non-conformance and action tracking – all complex processes involving pronounced interaction.

These results demonstrate that SMEs have a strong desire for greater process efficiency, which is surely due to the high cost pressure.

The positive, shared database that results from mutual, operational business processes enables a high-quality, effective communication between sales and purchasing in the participating companies. This in turn enables a fact-based contract and risk management, which results in the ongoing development and validation of mutual trust and therefore leads to successful business development.

Which processes do you already manage with your suppliers using a shared electronic tool (portal/platform)?

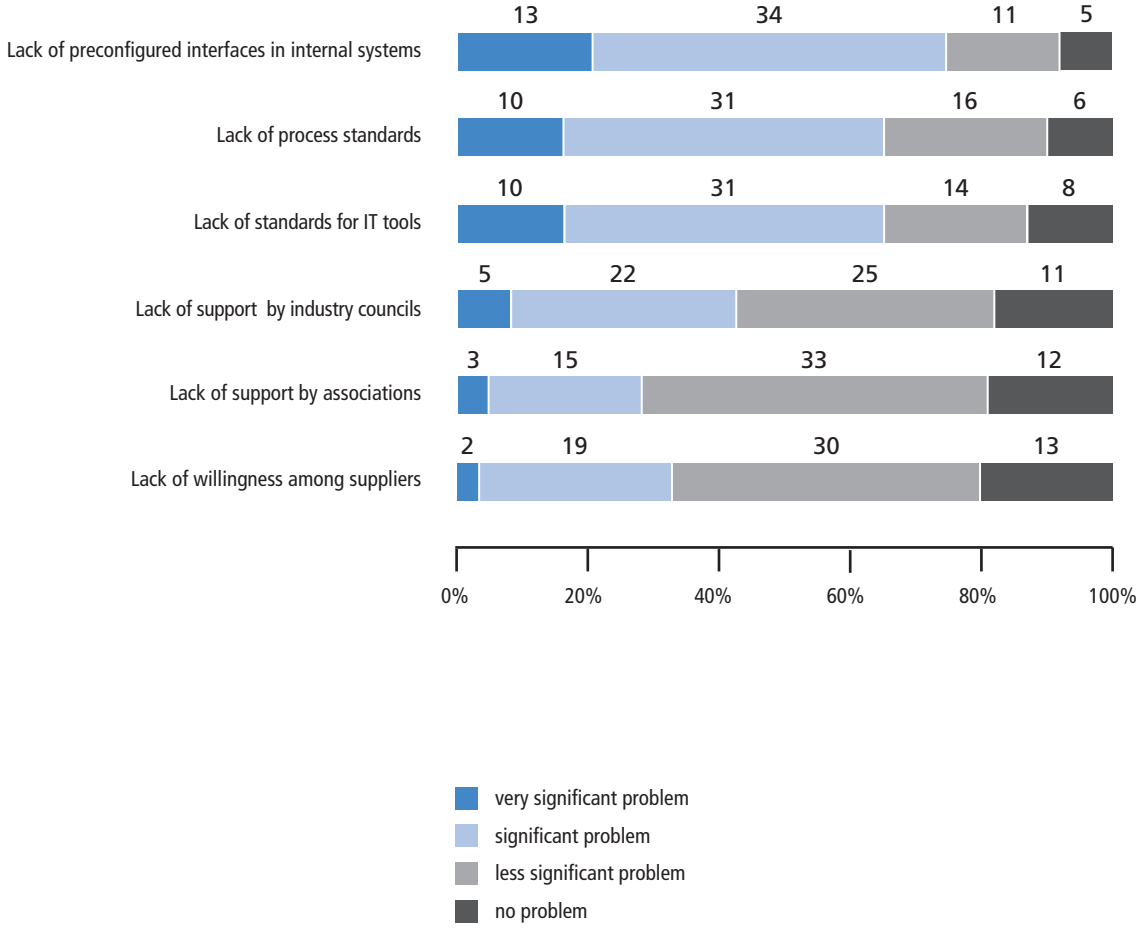


OBSTACLES TO INTEGRATION WITH SUPPLIERS

There are several obstacles standing in the way of meeting the strong desire for greater digitalization in supplier processes (see previous page): The three most serious problems include 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.

Most of the respondents feel well-supported by industry councils and associations, or do not view the lack of support as a major problem. The survey also illustrated a clear willingness of suppliers to support their customers in their digitalization efforts.

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



Markus Quicken
CEO, SupplyOn AG

DIGITALIZATION OF THE SUPPLY CHAIN – ACROSS ALL LEVELS

Not only does the present study confirm it, we experience it on a daily basis when consulting with our aerospace customers: Digitalization of the aerospace supply chain is considered throughout the industry as one of the most important actions for meeting the challenges of the coming years. However, there is a large gap between desire and reality. Not with regard to the cooperation between OEM and top-tier suppliers – production processes here are already largely digitalized, especially for production materials. The disparity is evident early on in the supply chain. The strong participation of SMEs in this study and their clear expectations underlie our mission to consistently further develop our solutions.

As the provider of Europe's leading supply chain collaboration platform AirSupply, we consider it our duty. In certain cases, AirSupply can already be used to digitally portray up to four levels of the supply chain – i.e. from OEM to tier 3 suppliers. We see our task in gradually expanding support for the industry, this network, which now encompasses some 2,000 aerospace companies.

Therefore, together with key industry representatives, we have formed an initiative that will help make digitalization a reality starting at the first level of the supply chain. Among other things, this includes a modular, staggered price model that offers a very attractive cost/benefit ratio even for smaller companies, as well as a supplier connectivity program with flexible, easy-to-use interfaces that facilitate integration of internal ERP systems with AirSupply, thereby conserving internal resources during implementation.

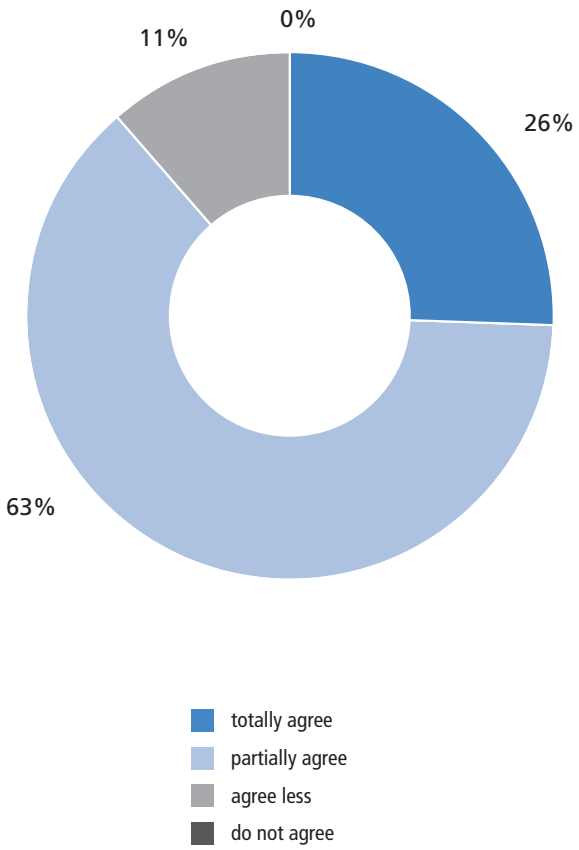
As the provider of the neutral collaboration platform AirSupply, SupplyOn is predestined to continue playing an active role in the standardization of processes and interfaces. While standardization efforts on the part of councils and associations play a very important role in this, converting those efforts into reality requires systems that can depict these standards and ensure industry-wide availability. This „enabling" aspect is what SupplyOn can contribute. Afterwards, the ball is back in the company's court, where the standardized processes can be implemented for use across all levels of the supply chain.

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.

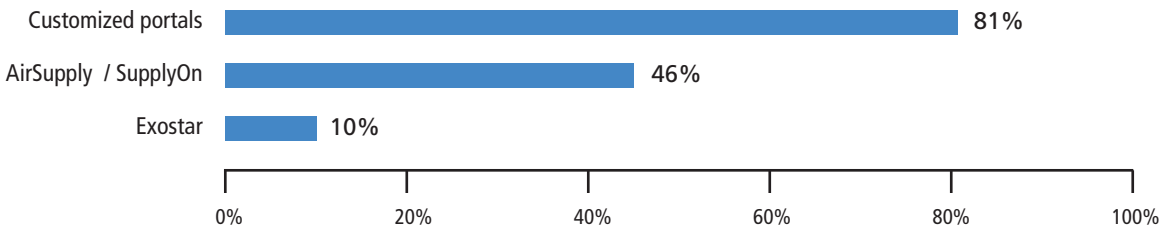
There is an urgent need to take action and reach a consensus regarding standardized processes and solutions that everyone uses, which would ultimately reduce the administrative overhead as well as generate cost benefits for everyone. This is also the only way to reach smaller companies. The findings from page 14 corroborate this as well. Lack of standards in processes and IT tools is considered one of the major problems with the integration of suppliers.

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



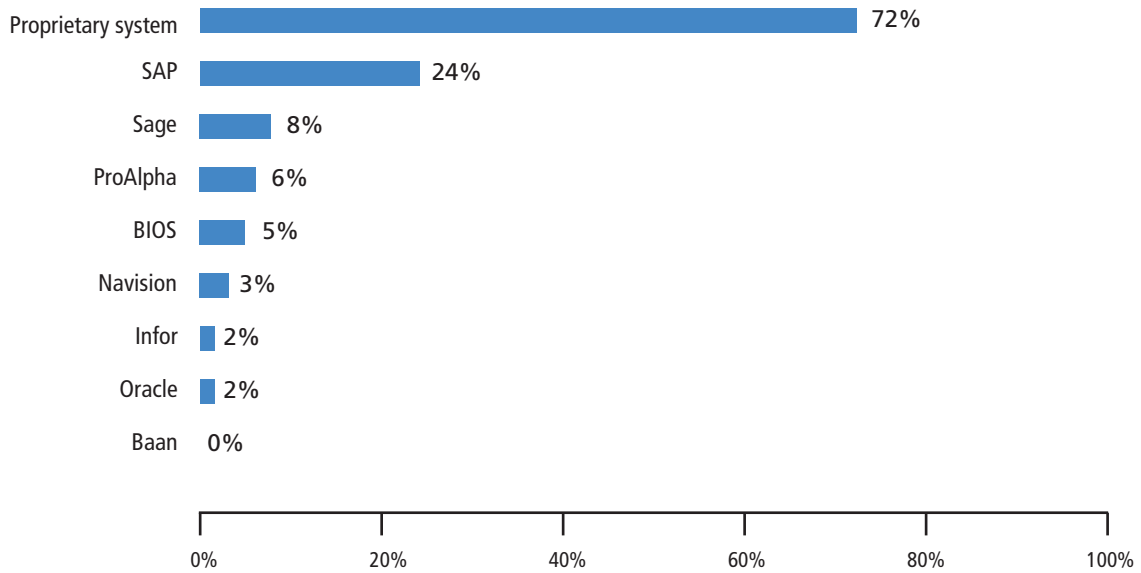
The AirSupply solution from SupplyOn for the collaborative handling of processes with suppliers is the clear market leader in Germany with a degree of use of 46 percent, compared to Exostar with a degree of use of just 10 percent. Thus, there is a high potential that AirSupply will be able to establish itself as the standard solution for industry-wide use.

Which portals and platforms do you use?



The diversity of ERP systems used internally is also interesting. Three-quarters of the respondents reports having a proprietary ERP system in use. Whereas standard solutions such as Sage, BIOS, ProAlpha, Infor, Oracle, Navision and Baan are only used by a few companies; SAP is still the most widely used with 24 percent.

Which ERP system do you use?



CHALLENGES – WHAT WILL BE THE FOCUS IN THE NEXT FIVE YEARS?

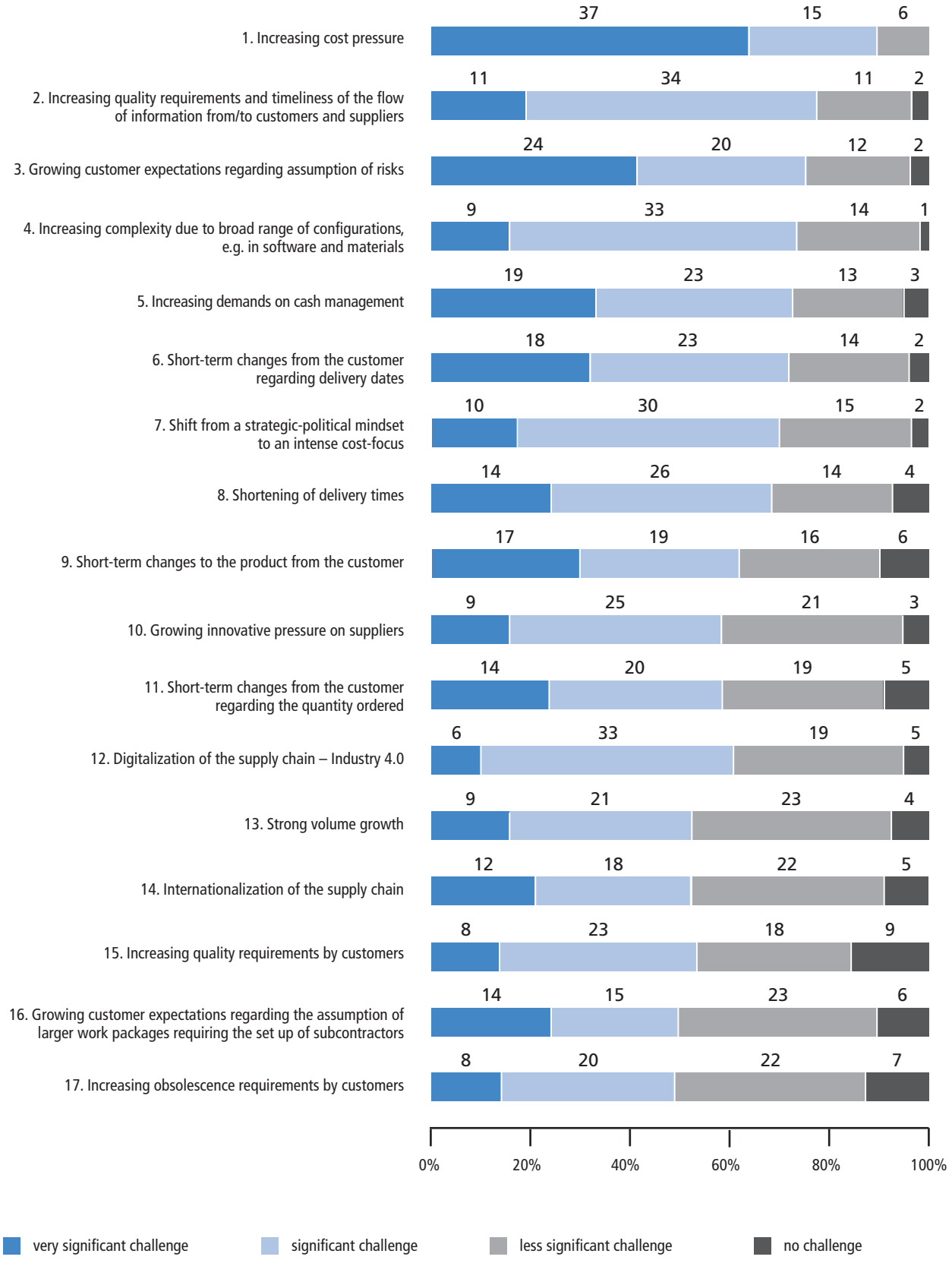
As expected, rising cost pressure was cited most by the companies surveyed when asked what the most significant challenges would be in the coming five years. Nearly 90 percent of respondents viewed this as a significant or highly significant challenge. A general trend in the industry, cost pressure is 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 (see 7th item cited)

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.

Even though the graphic suggests a diminishing role of other challenges polled in the study, it must be stated the even the subsequent citations are still viewed largely as a significant or highly significant challenge.

It is noteworthy that approximately half of those surveyed see no major challenge in the growing quality requirements of the customers. This is likely due to the fact that quality requirements have been on a very high level for years and suppliers seem to have this aspect under control. Joint assurance of the highest product quality has been an active process for years, the key products have been successfully developed and launched and the industrial learning curve appears to be mostly completed.

What will be the greatest challenges for your company in the next five years?



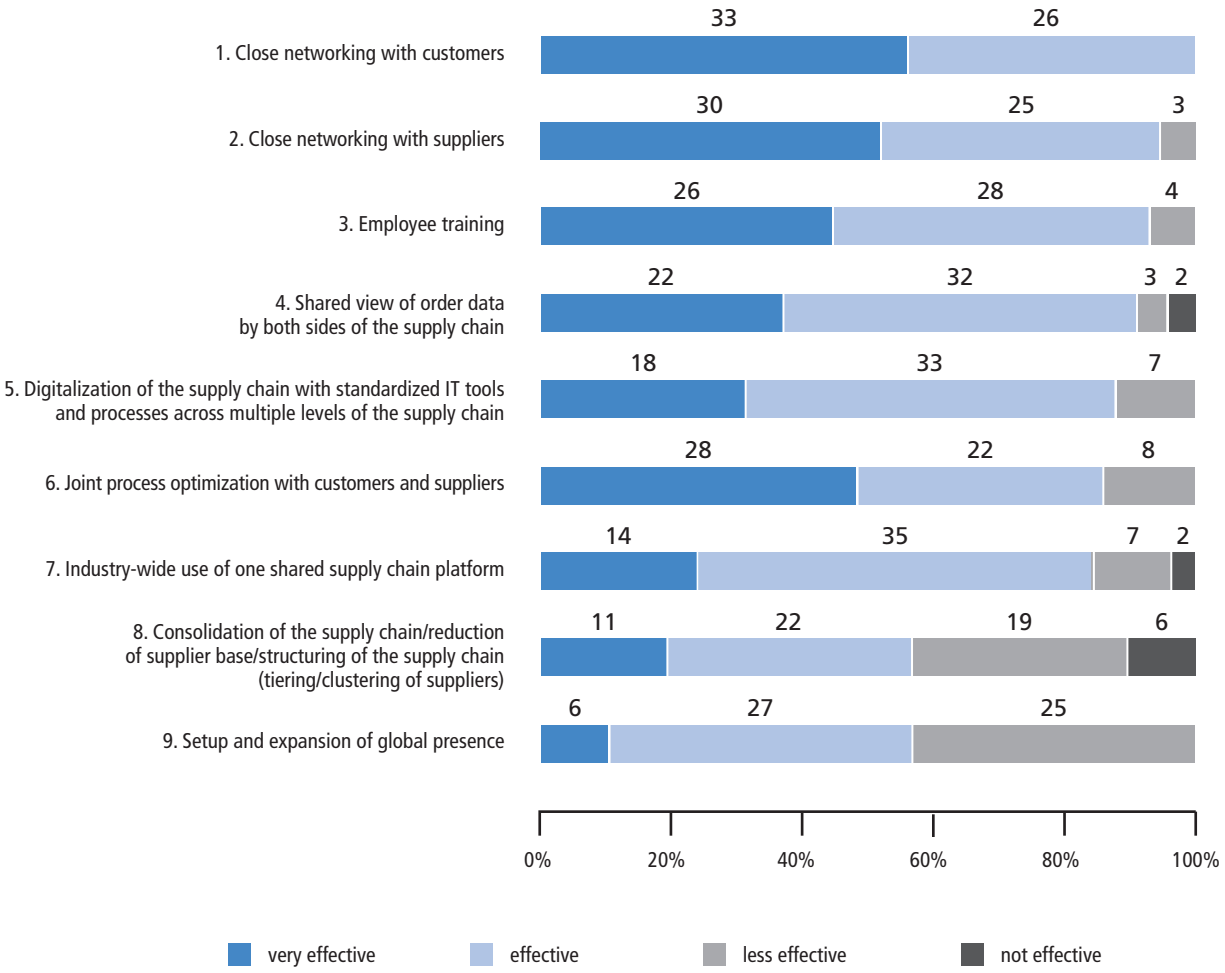
EFFECTIVE MEASURES: WHAT SHOULD BE DONE?

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

Very closely connected to the first two actions, those actions rated third to seventh are almost as important as the first two because they also focus on intensifying customer and supplier relationships and increasing the overall efficiency thereof: "A shared view of order data", "joint process optimization with customers", "industry-wide use of a common supply chain platform" and "use of standardized IT processes and tools across several levels 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.

The consolidation of the supply chain that is associated with a reduction in the supplier base and the expansion of the global presence is viewed as considerably less effective compared to the actions 1 – 7.

How effective do you view the following actions in meeting these challenges?



POTENTIAL FOR THE AEROSPACE SUPPLY CHAIN: CONCLUSION AND RECOMMENDATION

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 the optimum synchronization of all company divisions on the basis of the S&OP process. The integrated planning and control of demand (on the basis of forecasts and received orders) and ability to deliver (on the basis of operational expertise) required for this as well as the rapid response to risks and opportunities all demand relevant, timely, correct and uniform data to support both internal and cross-company decision-making processes. Solid and consistent information management that draws strictly from data is not feasible without further digitalization in 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.

>>> Supply Chain Excellence requires an excellent information management system based on a standardized, secure, digital infrastructure.

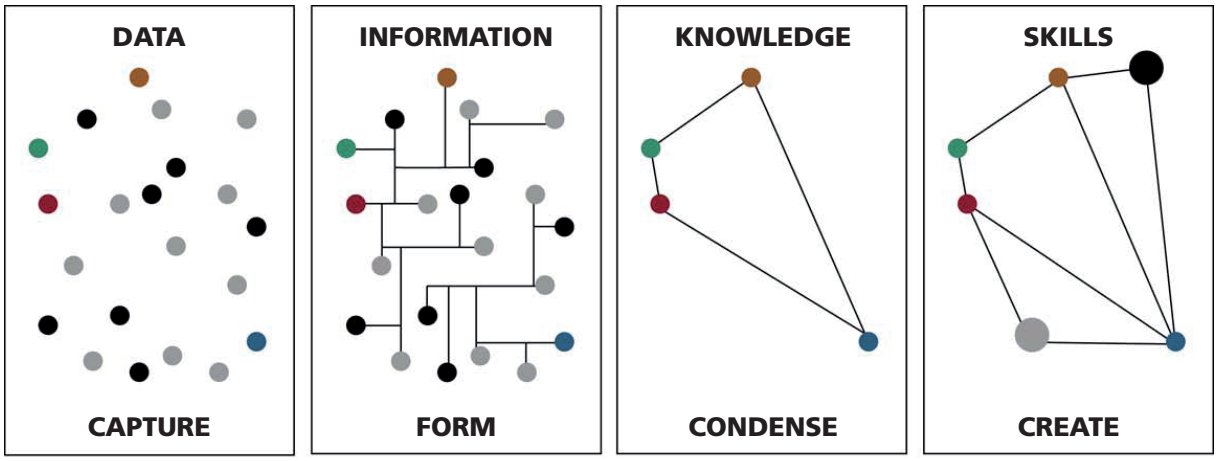
Bert Stegkemper
International Operations Excellence
Coach & Consultant

DIGITALIZATION OF THE SUPPLY CHAIN REQUIRES PEOPLE

Advancing internationalization and industrialization of the aerospace industry results in consistent pressure to improve. Digitalization is rightly viewed as one of the most important measures for achieving this. Keywords such as Industry 4.0 underscore the fact that a radical change is imminent.

We already have virtually unlimited computing power along with increasingly standardized and specialized software. Big data, extensive networking and continuously improving algorithms appear to be the solution.

But can complex aerospace supply chains even be captured and digitally depicted?



www.aca.team

Generating shared, current and relevant data is a first key step, given the widespread use of ERP systems and efficient collaboration platforms. An important point to remember here is: The more comprehensive the pool of data, namely from all key participants from the beginning of the supply chain to the end, 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.

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. Company-wide implementation is only possible when people are involved and with the contribution of all experts and competency owners.

The results of the present study show that it is precisely these adaptive challenges that must be met along with the technical aspects. The aerospace industry can do it: Flight guidance and management systems have achieved an incredibly high level of digitalization. These human-machine systems 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, experience and skills not only during normal operation but also in unforeseen circumstances.

Companies need to ask three questions in order to navigate this complex environment:

- How will digitalization help us further develop our core business?
- How do we integrate people in such a way that their specific knowledge and expertise can be incorporated into tools and processes and used?
- Which surplus values can we create through digitalization – with our customers, our suppliers and in each individual operation?

The vision of an end-to-end supply chain management will be successfully implemented in the aerospace industry – as it was in the past with the visions of CIM and CAM.

Peter Schwarz
Managing Board
Cluster Aerospace bavAIRia e.V.

Michael Santo
Managing Board
Unternehmensberatung h&z

DISCUSSIONS WITH TIER 1 AND OEMS AT EYE LEVEL

Uniformity and consistency of material and information flow as basic prerequisites of a functioning supply chain are common knowledge today, but at a level that is still far removed from professional Supply Chain Management. For that, much more comprehensive know-how and applicability of the relevant methods and processes is required from all participants of a supply chain. Only then can it be ensured that customers and suppliers meet at eye level, and that possible problems or conflicts are solved in a factual and target oriented manner between both parties.

In order to achieve this, knowledge build-up along the SCOR model (Supply Chain Operations Reference Model) has been a proven approach that is also the basis of training within the framework of the Supply Chain Excellence Initiative for aviation suppliers in Germany. In addition to a kick-off workshop, the program consists of four main modules:

1. **Design & Plan**: Planning and design basics of supply chains and basic terminology definitions
2. **Source:** Procurement models, supplier management basics and target conflicts in procurement (for example price/availability/quality).
3. **Make:** Tasks related to internal and external manufacturing processes and the eight types of wastage (the seven known types plus the insufficient use of employee know-how).
4. **Deliver:** Supply and delivery models (make-to-stock, make-to-order, Kanban systems), transport optimization and the order-to-cash process.

Since the imparting of theoretical knowledge is only one building block of implementation feasibility, the training participants will develop concrete transfer plans, detailing how and where insights gained during training can be transferred to the operative business, then report these findings at the beginning of a new module. Furthermore, training also addresses elements from negotiation training, conflict management and change methods and thus imparts the capability to successfully start and maintain change processes within their own company.

With this combination of theoretic and practical contents, the training **within the framework of the SCE module "Multi-Tier S&OP"** supports the targeted buildup of supply chain know-how at all levels of the supply chain, but mostly for Tier 1 to Tier 3 suppliers. These have, according to recent h&z studies, felt that there is still much room for improvement in this area. The companies that are currently engaged in ongoing pilot trainings have progressed far beyond this point of self-realization, and almost all of them have started internal programs of their own for optimization of their supply chains in parallel with the training classes.

Axel Krein
Senior Vice President
Cyber Security
Airbus Group

COMPREHENSIVE PROTECTION OF IT SYSTEMS

Significant potentials for increasing efficiency will be addressed and completely new business models will be created with the upcoming digital transformation. However, the potentials tied in with this transformation can only be unlocked if the companies are able to provide the new processes with sufficient protection against cyber attacks.

Attacks on IT systems in products and production facilities as well as in office IT systems have increased in recent years and this has had significant effects on some companies. Reports covering successful attacks on companies such as Sony, Target or Chrysler are being published on a regular basis and not only cause damage in terms of the directly related costs, but also to the reputation of the company affected.

Many companies, particularly smaller ones, are not sufficiently prepared for such attacks. They lack the technical competence, necessary processes and sufficient organizational capacity to face these problems. There is also frequently a lack of awareness – which is often heightened promptly following a successful attack.

There are currently a wide rage of IT security providers on the market, yet there are also an overwhelming number of stand-alone solutions, which are not linked to one another. That is why it is of fundamental importance for companies to gain independent security competence, so that they are in a position to select the best combination of technical, procedural and organizational measures and adapt them to suit the specifics of the company.

In addition to commissioning classic security providers to safeguard the existing company IT landscape, it is also recommended to take advantage of established cooperation services. In this respect, supplier-collaboration platforms such as BoostAeroSpace, which take the issue of security very seriously, should be taken into consideration.

All experts agree that 100% security is not possible. However, all sufficient security measures should be part of the standard equipment of every company. This is not a one-off task but rather a perennial challenge. A company can only be sufficiently protected through a combination of appropriate technological, procedural and organizational measures. This is not purely an IT issue but rather a challenge for companies and society as a whole, which we will have to address, particularly in light of the pending digital transformation. As part of this process, close collaboration of all stakeholders is absolutely required. We are ready for this task.

"Digitalization enables a decisive increase in efficiency and performance for the aerospace supply chain. I am in particular looking forward to seeing substantial progress in the end-to-end management of demands as well as in real-time collaboration with suppliers. Integrated data pools, intelligent big data analysis models and "smart" products will offer new options to sustainably strengthen performance and quality within the aerospace supply chain. This is indispensable considering the supply chain challenges during critical production ramp-ups."

Dr. Matthias Mette
Chief Procurement Officer, Premium AEROTEC GmbH

"Our business environment and the markets are changing extremely fast. It is therefore increasingly important to be closely linked with our suppliers. We need a harmonized, transparent and robust demand planning process, based on a partnership approach on equal terms to realize such a value creation network with our suppliers."

Stefan Glück, *Senior Manager,*
Airbus Helicopters Deutschland GmbH

"Standardized processes and a solid data basis are a valuable prerequisite for cooperation within a value-creation network. Potential is recognized faster and implementation is facilitated."

Benno Speer, *Network Manager,*
Forum Luft- und Raumfahrt Baden-Württemberg e.V.

"What we need is a single, seamless digitalized environment – and not an individual solution for each and every customer we need to connect to. Moreover, we need fast and simple solutions which can be used directly without being customized. This requires well-conceived standard processes as well as straightforward interfaces to conventional ERP systems. Only in this way can we participate, incorporate ourselves and benefit without jeopardizing our economic foundation."

Thomas Mauthe, *CEO, Schüschke GmbH & Co. KG*

"Digitalization of the supply chain offers an opportunity for revolutionizing collaboration within the supply chain. However, the requirements for relevant systems will need to be far more extensive to fully benefit from the viable potential. To solely concentrate on forecasts and order management will by no means suffice to optimally manage a supply chain. The diverse possibilities we see are currently not being detailed or discussed in any way. We, as a Tier-2 supplier, would like to take part in the design phase for software to offer our customers the maximum possible cost advantage in the future."

Rolf Philipp, *Managing Partner, Aircraft Philipp Group*

"The digitalization of the supply chain is underway, therefore giving a competitive advantage to those companies embracing a faster and better implementation. In doing so, the preliminary stages in product development processes should not be disregarded: a large part of the relevant production and supply chain information is already defined in the early stages of product development. If this information is integrated into the digitalization processes of the supply chain, additional significant advantages in terms of leadtime and costs can be leveraged."

Tobias Geißinger, *Managing Partner, P3 group*

"Due to the fact that especially aerospace companies typically have a high percentage of external procurement, it is vital that we ensure that our partners and suppliers are supported and connected closer to our company through digital process support. A faster, more secure and extensive data exchange is increasingly defining not only product quality but also the efficiency of our production processes."

Andreas Lindenthal, *Managing Board, OHB System AG*

"Our long-standing experience as an international industrial association for aviation and aerospace has taught us that the digitalization of the supply chain enhances the competitive capacity for all suppliers – especially within the aerospace industry. From material suppliers to parts and component manufacturers on through to the first-tiers. The full traceability of parts, sub-assembly or assembly – from a raw material batch to individual OEM P/N – can only be achieved digitally. A digital supply chain which offers a DNA profile for each individual part or component would be of greater value to the OEM, thus making it more competitive than a non-digital supply chain."

Joachim Hildemann, *Principal, Hildemann+Partners*

This study was developed by Stegkemper GmbH
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