

3PL/4PL to strengthen the supply chain

A whitepaper by
thyssenkrupp Aerospace



thyssenkrupp



**Do it
yourself or
outsource**



The 3PL/4PL approach to bolstering the aerospace and defense supply chain.

The challenges spearheaded by the pandemic and the Russia-Ukraine conflict have led to unprecedented disruptions to global supply chains with the result that questions about supply chain management, risk and resilience find themselves at the top of the agenda for CEOs like never before. Beyond the immediate hurdles presented by the pandemic and conflict in Europe, the global risk environment is increasingly focused on concerns about extreme weather, climate action, access to skilled labor, cybercrime and securing the long-term supply of parts and raw materials. Not surprisingly, a survey conducted at the end of 2021 by management consulting firm AlixPartners found that supply chain issues are the biggest concern of CEOs.¹ A separate survey by Ernst & Young showed that CEOs are resetting their risk radar, with supply chain disruption being one of the most powerful driving factors. Asked if they are adjusting - or are planning to adjust - global operations or supply chains, 79% of CEOs said they are.²

Companies in the aerospace and defense (A&D) industry are facing the same issues as other manufacturing businesses, along with others that are particular to that sector, where delivery delays and high-cost recoveries along the supply chain – starting with the OEMs – have almost been the norm. The current crises are merely part of a long list of disruptive events that have dramatically emphasized the need for bolstering supply chains and making them far more resilient. Improved transparency and collaboration are vital here.

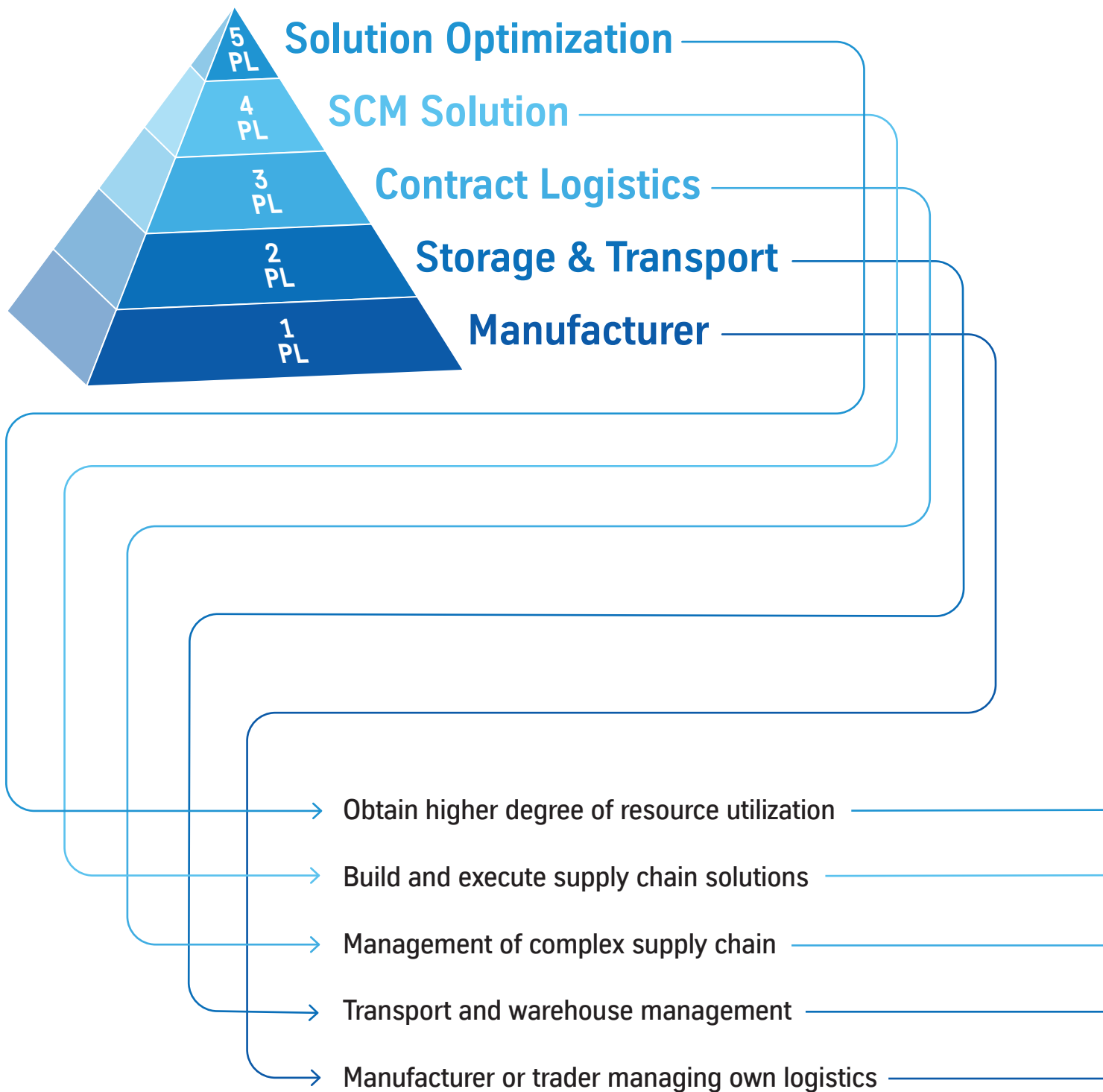
With the goal to reconfigure supply chains, this whitepaper looks at one of the options to do just that – outsourcing supply chain management to a third-party supplier – with a specific focus on the aerospace and defense (A&D) industry.

In particular, this paper covers:

- why supply chain resilience is in the spotlight;
- the growth of the third party and fourth party logistics (3PL/4PL) markets;
- the benefits of using a 3PL or 4PL supplier;
- what to look for when selecting an outsourced logistics provider;
- a case study of a successful partnership;
- an approach to customization, a vital part of 3PL/4PL services.

¹ CEOs Are Worried About Losing Their Jobs in 2022. | ² EY survey shows firms are 'resetting risk radars'.

The hierarchy of logistics services





5PL

Fifth-party logistics

is what happens when the switch is made from supply chains to supply networks. A 5PL service provider guarantees the management of networks of supply chains. The industrial actor hires third parties for the supply of strategic, innovative logistical solutions and concepts. A 5PL service provider develops and implements, preferably in close consultation with the client, the best possible supply chains or networks.⁵

4PL

A fourth-party logistics provider

adds a further level of data-based intelligence by offering end-to-end supply chain management for their clients. The 4PL partner is responsible for all of the supply chain management, for assessing, designing, building, running, and measuring solutions for the client. Leading 4PL providers use digital tools to provide a fully transparent view of the supply chain, overseeing the mix of warehouses, shipping companies, freight forwarders and agents.⁴

3PL

Third-party logistics

refers to outsourcing logistics processes, including transport, inventory management, warehousing, and fulfillment, to a third-party business. A 3PL provider brings expertise and best practices that can be effectively integrated into the existing supply chains of its clients.³

2PL

Second-party logistics

means a subcontractor provides straightforward logistics services such as LTL or parcel to the manufacturers.

1PL

First-party logistics

refers to the activity where the manufacturers take care of the transportation and logistics themselves.

³ The Difference Between a 3PL & 4PL | ⁴ What is Fourth Party Logistics? | ⁵ Fifth-Party Logistics Model

A&D supply chain risks and challenges: an old story given new emphasis

Supply chain resilience in the A&D manufacturing sector is far from a new topic and some of the problems affecting it stem from the very nature of the A&D industry. Events of recent years have put the A&D supply chain in the spotlight and accelerated the need for change.



Complexity is hard to manage

A&D companies are part of a highly complex network, comprising hundreds or even thousands of suppliers in a multi-tiered, webbed relationship. The A&D supply is a complex international ecosystem of OEMs, multiple tiers of suppliers, maintenance, repair, and overhaul (MRO) providers.⁶



Lack of transparency

This complexity makes transparency across the supply chain extremely difficult, which in turn means the process of adapting capacity across all tiers to the new market

needs takes too long. Transparency is the Holy Grail of supply chain management and is, realistically, unattainable except to those large companies with significant global resources.



Vulnerability to disruptions

As the supply chain has been globalized, with materials and parts production cutting across multiple geographies, it has become more vulnerable to disruptions. These have included wars, pandemics, political upheaval, extreme weather events and natural disasters.⁷

⁶ Building and managing supply chain resilience in aerospace and defense

⁷ Fixing the Vulnerabilities in the A&D Supply Chain

**Slow digital transformation**

Some A&D companies have been slow to adopt industry 4.0 technologies, and those that have tend to focus on production, not the supply chain. This is despite the compelling evidence that industry 4.0 technologies can be key to unlocking supply chain competitiveness and efficiencies.⁸ The transformation involved in adopting these technologies can also mean new skillsets have to be added to the business that were not necessary (or anticipated) before.

**Stockpiling**

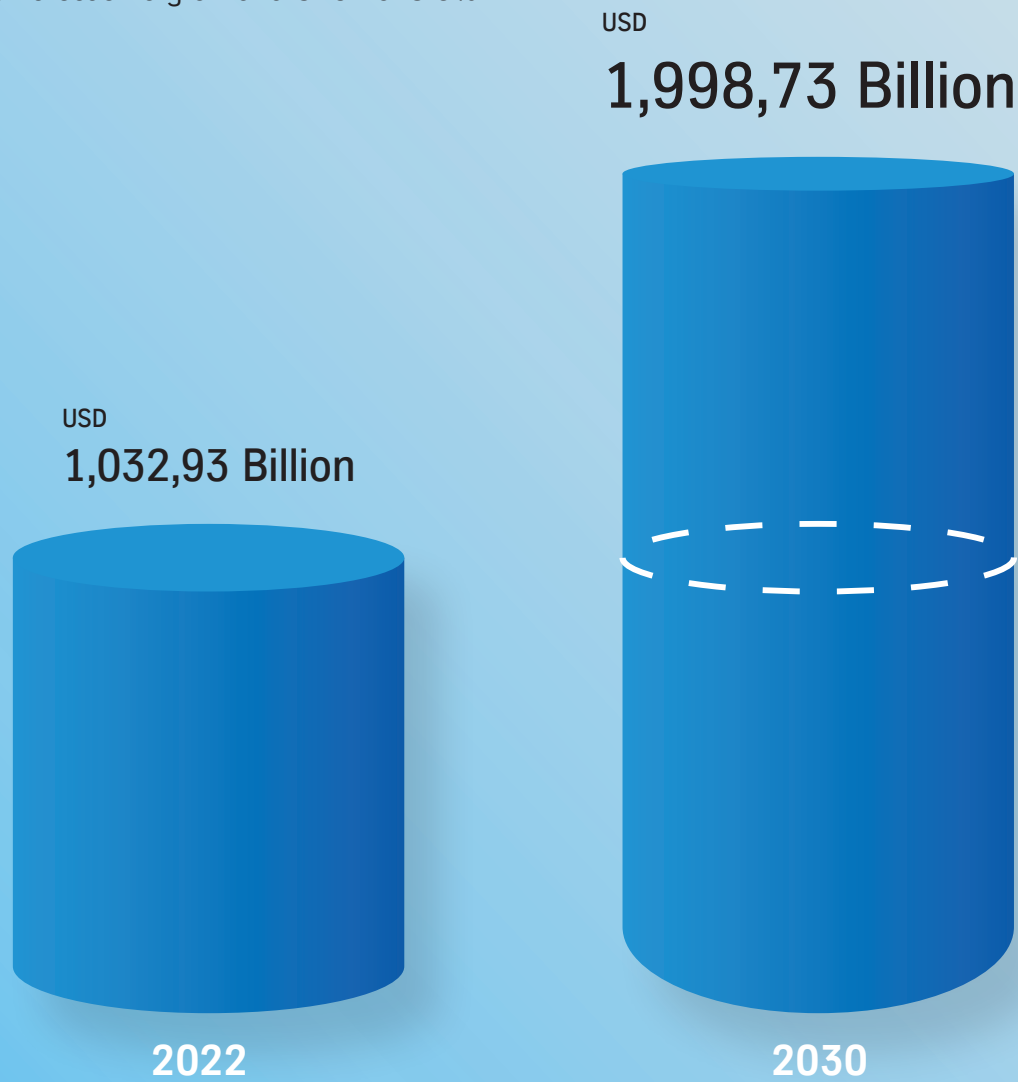
Long lead times and a high percentage of sole-source suppliers means that commercial aerospace companies tend to carry more than twice as much inventory as other manufacturing industries. This ties up a lot of much-needed capital that could be invested elsewhere.⁹

⁸ Aerospace & Defense 4.0: Capturing the value of Industry 4.0 technologies

⁹ Supply chain management in aerospace and defense: Cash is king again

Global Third-party Logistics Market

Market forecast to grow at a CAGR of 8.6%



Source: Research and Markets: Third-Party Logistics Report 2022

Opting for outsourcing: the growing market for 3PL and 4PL services

While some companies are building up their in-house supply chain management capabilities, many others prefer to focus on their core manufacturing competence and outsource this function to a reliable 3PL and 4PL partner.¹⁰ This trend, and the application of new technologies by logistics partners, is changing the 3PL and 4PL industry dynamics. Advanced data collection capabilities, warehouse automation, and digitalization of the entire supply chain are enabling companies to adopt a consistent, innovative, customer-centric, and agile approach that presents their customers with real competitive advantages. This is driving the growth of the global 3PL market, which is expected to reach US\$1,998.73 billion by 2030, registering a CAGR of 8.6% from 2022 to 2030.¹¹

Similarly, the global 4PL logistics industry generated US\$57.9 billion in 2021, and is anticipated to generate

\$111.7 billion by 2031, with a CAGR of 6.7% from 2022 to 2031.¹²

For the vast majority of companies that opt for the outsourcing approach to supply chain management, the partnerships are working well. According to the 2019 Third-Party Logistics Study, 73% of 3PL users and 91% of 3PL providers agree that 3PLs provide new and innovative ways to improve logistics effectiveness.¹³

The benefits of using a 3PL/4PL provider, and why their services are effective at managing supply chain challenges, are outlined in the following section.

¹⁰ Aerospace Logistics: Building for Growth. Inbound Logistics.

¹¹ Third-Party Logistics Market Size, Share & Trends Analysis Report (2022).

¹² Fourth Party Logistics (4PL) Market to Reach \$111.7 Billion, Globally, by 2031

¹³ 2019 Third-Party Logistics Study: The State of Logistics Outsourcing

The benefits of entering into a 3PL/4PL partnership

The benefits of outsourcing supply chain management are well documented, including improved financial performance via an increase in inventory turnover (and less stockpiling); more efficient operations and the elimination of waste; increased operational flexibility and adaptability; asset reduction; and reduced cycles times and improved responsiveness, to name a few.¹⁴ Furthermore, there is abundant evidence showing that bundling logistics services by working hand-in-hand with a 3PL/4PL provider is one of the keys to strengthening the supply chain and providing better end-to-end services.¹⁵

Inventory Management



Dedicated
Warehouse



Multi-customer
Warehouse



In-house
Logistics

3PL benefits

One of the biggest benefits of entering into a partnership with a competent 3PL provider is the range of logistics services and value-added activities on offer that can be customized to suit the needs of individual customers.

Inventory management

An experienced 3PL provider can offer a range of options for inventory management, giving their customers the flexibility to choose the service that best suits them. There are three possibilities for managing inventory on behalf of customers.

- First, customers can opt for a dedicated warehouse operation.
- Second, customers can choose a shared area with other customers in a warehouse owned by the 3PL company.
- Third, customers can choose to have the 3PL service on their own premises.

Flexible service solutions

These include activities performed in the facilities, such as:

- managing production supply;
- dealing with aftermarket logistics including the returns;

- repair management;
- managing the cycle of returnable items like tools and empty containers;
- pre-production jobs such as kitting packaging and quality inspection.

Solid service enablers:

- technology and IT integration;
- excellent customer support;
- quality management to be compliant with industry standards;
- and last but not least, performance management and reporting.

This level of flexibility and value-added services enables the companies that work with 3PL partners to focus on their core business. Other benefits include:

- reduced lead times and cost savings thanks to the efficient and state-of-the-art processes and technology from the 3PL;
- the model provides flexibility for organizations to scale up their business or enter new markets in different locations;
- co-creation between the service provider and customer to create a tailored solution.

Service Solutions



Production
Supply Logistics



Returns & Repair
Management



Vendor Managed
Inventory



Aftermarket
Logistics



AOG / Critical
Fullfilment



Packaging



Assembly
Kitting



Tools & Containers
Management



Quality
Inspection

Source: thyssenkrupp Aerospace

4PL benefits

Partnering with a 4PL provider that makes use of industry 4.0 technologies can lead to benefits that can be categorized under four broad areas.¹⁶

Powerful data analytics

4PL providers use advanced software and data analysis tools, offering:

- accurate analytics and the ability to react in real time (agility);
- optimized information for improved workflows;
- reduced delays and cycle/lead times.

Reduced supply chain complexity and improved visibility

A 4PL provider acts as a single interface between its clients and multiple suppliers and logistics providers. This results in:

- a single touchpoint for the entire supply chain and therefore reduced complexity;
- greater visibility throughout the entire supply chain;
- expert advice and operational support leading to continual improvements.

Operational efficiencies

Customization is also inherent in 4PL services, which provides the scope for a provider and its customers to co-create tailored solutions to specific needs, including customized data analysis:

- managed inventory levels (no stockpiling);
- materials delivered just-in-time;
- improved forecasting for production schedules and raw material needs;
- less capital tied up in inventory, therefore greater financial resources for other parts of the business.

Cost savings and leaner operations

Just like 3PL service providers, 4PL service providers are specialized at handling complex logistics setups, leaving their customers to focus their resources on their core manufacturing competencies. This has clear financial and operational benefits. Greater operational efficiency means:

- reduced operational costs;
- lower overhead and labor;
- elimination of wasteful processes;
- improved purchasing leverage from an expanded supplier base.

¹⁶ Top four benefits of 4PL

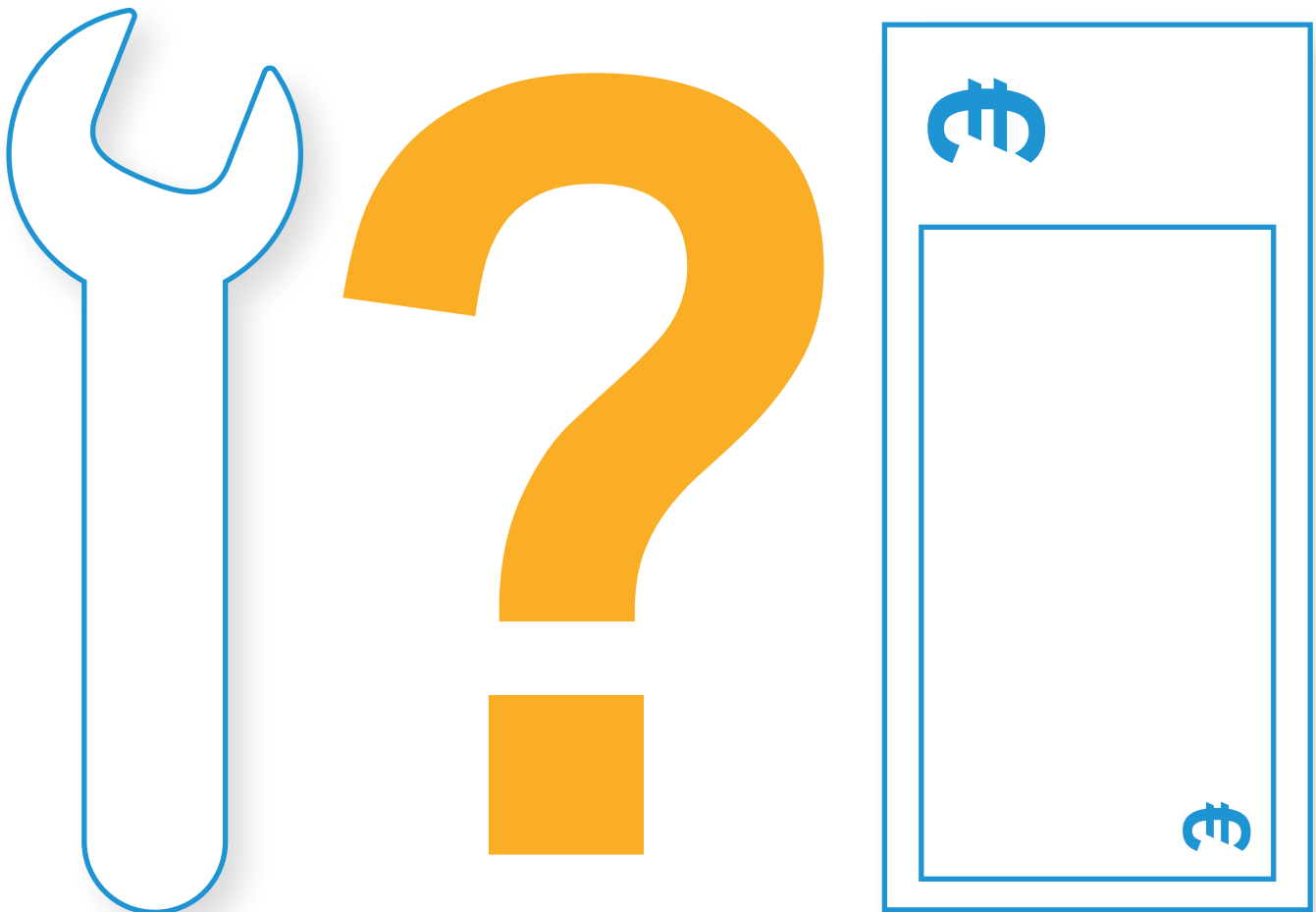
Make-or-buy?

Do it yourself or outsource?

With mounting pressure to take a new strategic approach to supply chain management, many companies in the A&D sector will be looking for the right answer to this disarmingly simple question. Outsourcing might not be right for every company, but for those firms that are taking a renewed look at how their supply chains can be a source of competitive advantage it may be the answer.

The same is true for those looking for an opportunity to redeploy capital that would otherwise be tied up in assets to support logistics operations, or companies that do not possess deep internal supply

chain management expertise. For these companies, outsourcing is an option that should be considered. Entering into a strategic partnership with a 3PL or 4PL provider is a proven solution to create value that goes way beyond cost savings. Focusing on prices and costs savings is absolutely necessary but it is a limited way of creating value along the supply chain. Supply chain management put under control of a strategic partner¹⁷ not only addresses procurement of materials, parts and systems, but also logistics planning to anticipate distribution and delivery challenges, lead times for orders, and inventory control.



¹⁷ Supply Chain 101: Moves from a Supporting Role to Strategic Star of the Show

What to look for in a 3PL/4PL partner

Choosing a reliable partner that will add value can be a daunting prospect. The following checklist will help with the decision-making process.

Is a 3PL or a 4PL service provider the right choice for your strategic supply chain needs?

Global reach:

The A&D industry is spread all over the world. Does the 3PL/4PL provider have the expertise and reach to operate globally?

Payment history & financial stability:

Having your 3PL suddenly fall apart could be one of the most devastating challenges your company faces. Finding a partner that has proven their financial stability will at least keep your operations from being brought to a screeching halt as you attempt to recover from someone else's mismanagement.

Proven track record:

Going beyond the finances of a potential logistics provider, what is their overall track record like? Do they have a track record of working with other reputable A&D companies? Do they have multiple long-term clients?

Excellent industry references:

The references provided by a potential 3PL/4PL partner should not just be good, they should be exemplary.

Scalability:

First and foremost, can the 3PL/4PL efficiently scale their operations to fit your changing needs?

Customization:

There is no one-size-fits-all to effective logistics support or supply chain management. Is the 3PL/4PL provider able to offer customized services that suit your needs and adapt these over time?

Industry 4.0 technology:

Along with scalability and customization, ensure the 3PL/4PL has the right technology infrastructure to support the strategic demands of your supply chain. It is also important the 3PL/4PL has a knowledgeable IT team to help troubleshoot any issues.

Digital capabilities and analytics:

Can the outsourced logistics partner offer digital solutions? This is central to its ability to provide operational benefits, including improved forecasting for production schedules and raw material needs. It should also lead to lower overhead and labor costs, a reduced inventory burden, the elimination of wasteful processes, and improved purchasing leverage from an expanded supplier base.

Delivery and materials handling:

Getting exactly the right materials at the right time and in the right place is the primary function of a 3PL/4PL provider. Does the provider have the expertise, experience, contacts, and global infrastructure to ensure this?

Value-added services:

Does the potential partner have experience and expertise beyond logistics? Can it offer value-added services to meet the changing needs of its customers and make their supply chains flexible, resilient, and transparent?

OneBox Case study: An outside-the-box solution for Roll

Customization is an essential requirement for a successful 3PL partnership. There is no one-size-fits-all approach. This is an example of exactly that, where the experts at thyssenkrupp Aerospace spent time getting to understand the specific needs of its customer, Rolls Royce Defense, before designing a simple yet highly effective solution for its aftermarket operations. The approach used by thyssenkrupp Aerospace, and the customized 3PL solution it designed, resulted in the company being awarded a 15-year contract to support Rolls Royce Defense.

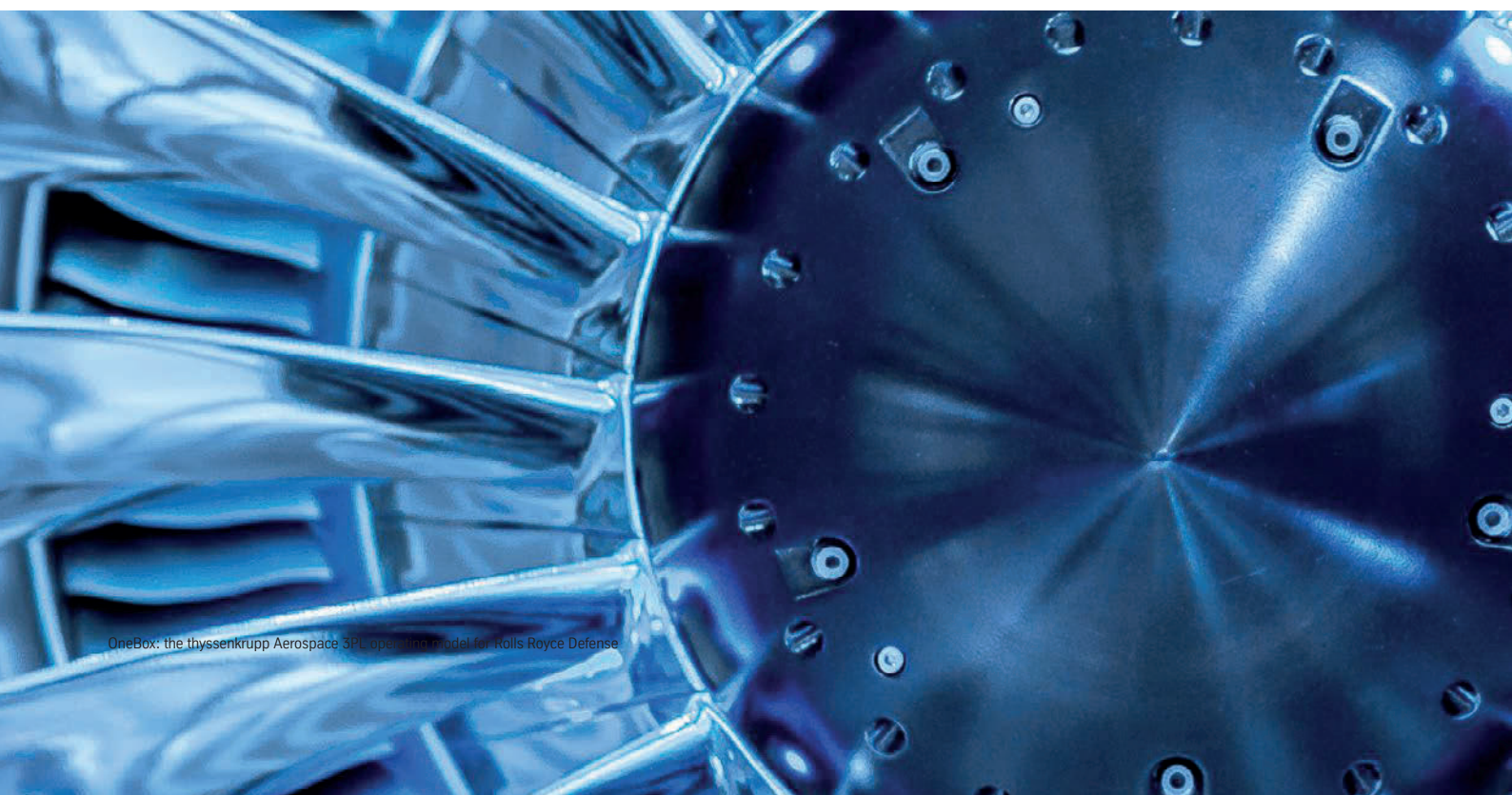
OneBox consolidates warehousing and logistics services to support the production and aftermarket operations of Rolls Royce in Indianapolis. As the illustration below shows, the focus of its design is on simplicity: standardized processes, one warehouse management system, and an optimized facility footprint. As the 3PL services provider, thyssenkrupp Aerospace consolidates all of the logistical activities and warehousing into a fully optimized single location.

thyssenkrupp Aerospace also manages all original equipment assembly of turbines and aftermarket spares. The long-term storage of US government

project materials, MRO parts, and fully completed engines is also managed by thyssenkrupp Aerospace.

Within OneBox, the 3PL services provided by thyssenkrupp Aerospace also includes IT-enabled asset traceability for all parts after they have been received from suppliers, from receipt to the warehouse shelves, to the kit, and then right through to the assembly locations in Indianapolis.

OneBox is an excellent example of a successful 3PL service that is a true win-win for both Rolls Royce and thyssenkrupp Aerospace.

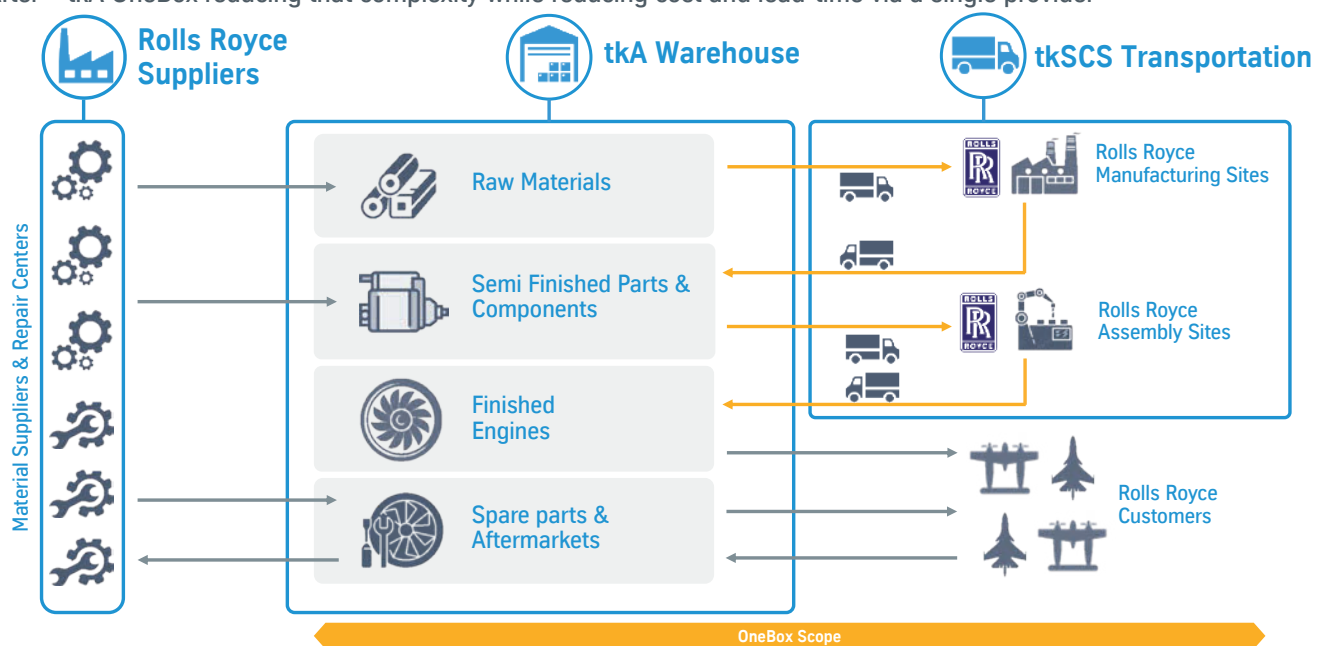


OneBox: the thyssenkrupp Aerospace 3PL operating model for Rolls Royce Defense

Rolls Royce Defense

Rolls-Royce “OneBox”

After – tkA OneBox reducing that complexity while reducing cost and lead-time via a single provider





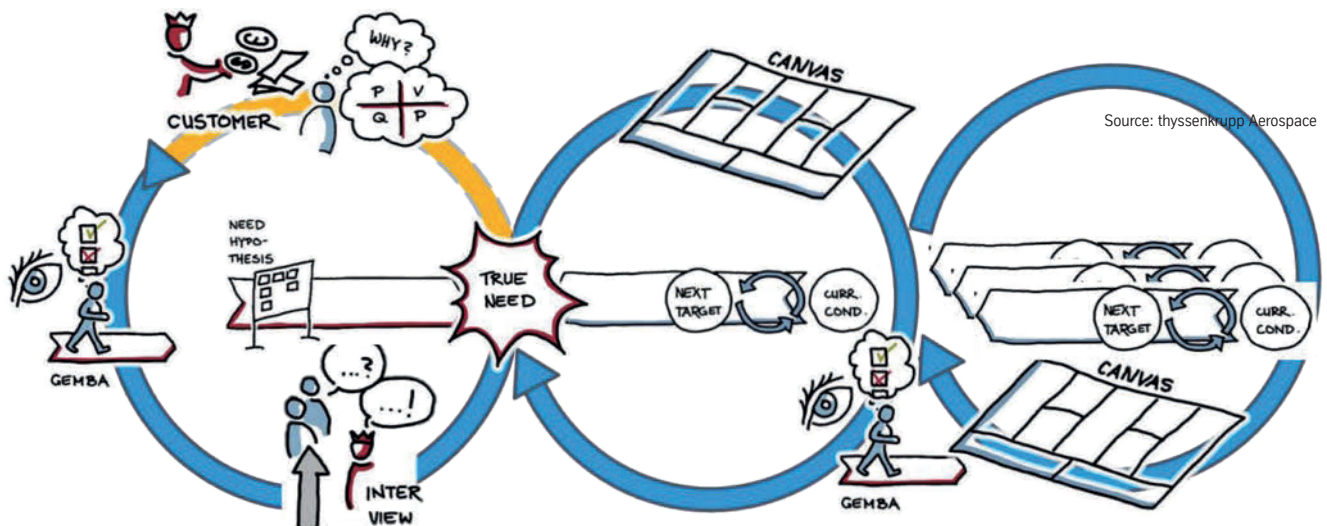
The thyssenkrupp Aerospace approach to customized 3PL/4PL services

A survey of more than 100 large organizations in multiple sectors found that those that regularly collaborated on supply chain solutions demonstrated higher growth, lower operating costs, and greater profitability than their industry peers. Clearly, then, co-creation is the key to effective supply chain design.¹⁸ A key feature of the thyssenkrupp Aerospace approach to customized solutions is the company's ability to design a value-driven business model or to adapt models to the needs of its customers. These solutions ideally require that customers already have a clear idea of what they want. But what happens when customers do not know what they truly need? This is where thyssenkrupp Aerospace has developed an agile approach to problem solving referred to as DPX, its recipe to drive performance through customer value, design and execution.

¹⁸ Taking supplier collaboration to the next level



Driving performance through ...



Source: thyssenkrupp Aerospace

... Customer Value (DPC)

... Design (DPD)

... Execution (DPE)

This customer-focused approach uses tools that aim to develop and test hypotheses over the process and find the right solution for the true need.

DPX is a cycle over three phases that moves from developing initial ideas to the final delivery of a solution. Each phase represents a single element of the company's sales journey.

DPC

Driving performance through customer value

The first phase is driving performance through customer value (DPC), which explores true customer needs. This first phase helps thyssenkrupp Aerospace to find out how it can respond to the needs of its customers with specific value propositions. Any search for good answers starts by asking the right questions. To identify customer needs that are sometimes hidden, the approach used by thyssenkrupp Aerospace focuses on three key aspects.

Develop first customer needs hypotheses
Have customer need hypotheses been clearly defined?

Has a list of hypotheses been prepared?

Derive and validate true customer needs

A true customer need: are the hypothesis validated and up to date?

Measure and prioritize customer value

This is all about measurements and prioritization. It enables thyssenkrupp Aerospace to check how its customers' needs can be quantified and how they can then be matched to the final deliverables.

DPD

Driving performance through design

The next phase, driving performance through design, or DPD, is about designing the solutions. The aim here is to enable those value propositions that were defined in DPC. In this case, thyssenkrupp Aerospace focuses on the solutions it wants to deliver, with its customers' needs in mind.

Develop solution hypotheses

In order to develop high-speed solutions, these questions first have to be answered:

- Is there a rough description of potential concepts that describes the solution from an operational point of view?
- Have right business case parameters been defined? In other words, is it possible to already describe possible concepts that will result in a solution from an operational perspective?

Prototype solution hypotheses

At this stage of the DPX process, it is important to answer the following questions:

- Has the designed solution been financially and

operationally evaluated? Does it clearly address customer needs?

- Has a proposal been prepared and presented to the customer?
- Has the customer given feedback?
- Once there are satisfactory answers to these questions, a prototype solution hypothesis can be designed and checked.

Exploit customer value

In the final step of the DPD, thyssenkrupp Aerospace checks whether its offer meets the needs of the customer and whether it is ready for implementation. The following questions must be answered at this stage:

- Does the offer clearly address customer needs?
- Has the customer approved the implementation of the solution?
- Has the business case been updated following feedback from the customer?
- Of course close contact with customers is crucial at this point.

DPE

Driving performance through execution

The final phase, driving performance through executions, or DPE, helps the customer to operate the corresponding solution. It follows a reliable structure to manage the customer relationship and involves the following steps:

- getting approvals and signatures so that the project can be implemented;
- ensuring that all KPIs have been defined and that the scope of this proposed service is met;
- ensuring that the workflow is carefully set up in collaboration with the customer.

To be able to customize solutions for its customers, thyssenkrupp Aerospace

uses a clear, agile methodology. This is why DPX is designed around what it calls the Lego brick approach. These bricks represent a range of existing tools and methods that can be used to build a fully customized solution centered on customer value.

It is worth emphasizing that DPX is not a terminal or linear process, but cyclical. For example, there could be a situation where the DPE is reached but then something changes, or there is a new opportunity to start the whole cycle again. In these cases, the DPX phases are repeated until a new, even better solution is developed.



Digital Capabilities: a central feature of resilient supply chains



It was previously mentioned that A&D companies have been slow to adopt digital technologies but digitalization is in fact the key to making the supply chain more resilient, transparent, efficient and sustainable.¹⁹ This is one of the factors that lies behind the growing trend for using a digital platform that allows executives to proactively manage their end-to-end supply chains in real time and achieve new efficiencies through connected visibility, proactive exception management, and predictive insights.²⁰ It is a way of connecting different suppliers from tiers one-to-three with each other and by making these connections, the control tower solution creates

¹⁹ Digitization in the Aerospace & Defense Supply Chain

²⁰ The Supply Chain Control Tower



transparency and improves communication between the different stakeholders. It also means dealing with one touch point – the 3PL/4PL provider – rather than many, and as such, it is highly effective at reducing the complexity that plagues the A&D supply chain.

Digital platforms are essential to smartly manage capacity and bring transparency into the whole value chain. For this reason, it should be an essential offering from any reliable and capable 3PL/4PL partner. With a control tower comes more reliable data and data analysis, which is the foundation of optimized order management, reduced delays and lead times, improved forecasting and supply chain agility. In other words, digital platforms and capabilities provides the all-important end-to-end visibility that too many A&D companies have been missing for too long.

Conclusion

For firms that are taking a renewed look at how their supply chains can be a source of competitive advantage, or for those companies that prefer to place their focus on their core manufacturing competence, outsourcing supply chain services to a reputable partner is an increasingly attractive option. A reliable 3PL or 4PL service provider can offer a level of expertise that has inherent benefits, including:

- ➞ powerful data analytics for optimized and improved workflows and reduced lead times;
- ➞ reduced supply chain complexity and greater transparency;
- ➞ operational efficiencies and just-in-time deliveries that negates the costly need for stockpiling;
- ➞ and leaner operations with reduced costs and the elimination of wasteful processes.

The growth of the 3PL and 4PL markets, which are forecast to grow by a CAGR of 8.6% and 6.7% respectively from 2022 to 2030, is clear evidence that there is a shift towards outsourcing supply chain services. The application of new technologies by logistics partners, such as control tower solutions, advanced data collection capabilities, warehouse automation, and enlightening of the entire supply chain, is changing the 3PL and 4PL industry dynamics and fueling the growth of the market.

Co-creation is increasingly seen as a key to effective supply chain design. Companies that co-create supply

chain solutions with a 3PL or 4PL provider benefit from higher growth, lower operating costs, and greater profitability than their industry peers.

Outsourcing supply chain management to a reliable partner, especially one that offers digital solutions, can lead to real competitive advantages. It can also contribute to a supply chain that is more resilient, agile and better able to react to disruptions. And with increasing pressure on A&D companies to reconfigure their operations with an emphasis on the supply chain, collaborating with a company that specializes in supply chain management may be exactly the right move.





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