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Defense Supply Chains

The end of ambiguity

Industry Edge

Industry Edge is PwC's unique set of capabilities powering how we deliver successful and trusted transformation and business model reinvention outcomes.

PwC's Industry Edge brings together leading industry perspectives and business models, underpinned by technology, data & AI assets, ecosystem partnerships, curated solutions and execution enablers. It is designed to accelerate your journey to the leading edge in your chosen industry sectors.

Background

In global landscape is growing increasingly complex. The challenges of hybrid warfare and rapid technological advancements are demanding agile responses. As outlined in our recent publication—The future of public defense organizations: Increasing defense outputs and building credible deterrence— streamlined and integrated supply chains are urgently needed to enhance operational efficiency and enable the readiness of military forces. While the need for reform in defense supply chains amid a backdrop of escalating geopolitical tensions is well understood - enacting change in an inherently complex and increasingly fragile global supply chain environment is not a simple task.

This deep dive will explore the intricacies of supply chain management focusing on the current challenges faced and the opportunities that lie in adopting innovative solutions and good practice. We outline eight connected recommendations for delivering a strategic overhaul of defense supply chains. While each recommendation can be beneficial on its own, the most important one is the first: creating a customer-driven architecture to guide and prioritise all other recommendations. By examining how supply chain supremacy can serve as a transformative capability this analysis aims to provide insights on how defense organisations can better equip themselves to meet contemporary threats and safeguard national security.

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2 **Implement detailed planning and forecasting**

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Introduction – The case for change

Global defense supply chains are in turmoil for a range of concurrent reasons. The war in Ukraine is fundamentally changing assumptions around warfighting and in turn the war fighter's requirements of supply chains. The global supply chain environment has become far more fragile, risky and competitive, impacting the availability of supply and associated risks. Existing supply chains in most nations are outdated and fragmented, often operating on old information systems and designed around organisations and equipment programmes rather than processes. Nearly all nations are struggling with a constrained economic environment in which attributing of funds to defense require challenging trade-offs in emotive areas such as health, education and social security. Finally, the rapid political shifts are compelling nations to promptly reassess their defense strategies, leading to significant transformation in the supply chain landscape. While these factors differ by region, their combined impact means that few nations can avoid the need for comprehensive reform of their defense supply chains - which in recent years have suffered from underinvestment. This state of affairs has to change. The evolving operational environment— with increased proximity, scale, and duration of conflicts in the minds of politicians and military planners— requires a transformation. Governments have been swift to focus on the positive impacts of the defense industry on their economies as drivers of innovation, employment and prosperity. But the focus on capacity increase and innovation is a politically expedient one.

Through our work supporting national governments, NATO and private industry we have seen at close quarters the issues faced by defense. For supply chain these issues can be characterised by poor performance, ageing infrastructures, outdated and fragmented Information Systems and siloed organisations and budgets.

Customer requirements have changed— placing focus on mass, scale, volume, velocity, agile innovation. But supply chains are often starting from a poor position in terms of performance and maturity. Addressing the gaps between requirements and capabilities will require structural and fundamental change.

In this article we explore eight interlinked recommendations that recognise the defense supply chain for the complex system that it is. Although each recommendation delivers standalone benefit the primary recommendation – a customer driven architecture – sets the context and priorities for all the other recommendations.

1

Take an architectural approach

Over the years attempts to improve supply chain performance have tended to look at component elements of the supply chain system rather than taking a whole system approach and consequently have often been detrimental to overall performance. As a result, the supply chain is often a misunderstood term as it fails to communicate the complex system that enables the supply of equipment, materiel and services to be matched to the customer ’s demand.

Taking a genuinely whole system, or architectural, approach drives a clarity of purpose and a set of design principles for the supply chain system.

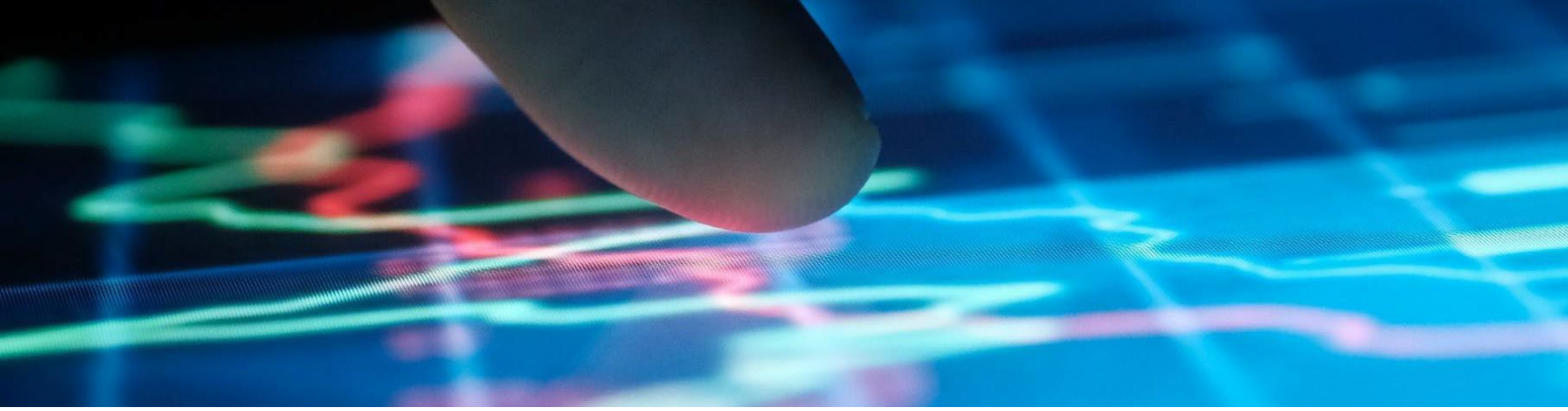
Fragmentation has been driven by the varying requirements and priorities of constituents rather than a singular purpose. Furthermore, the singular purpose must be customer driven. The precise identity of the customer of the defense supply chain has been the subject of much debate. In the current political and operational context, the customer is considered to be the war fighter and the supply chain system must be designed to enhance performance within the available resource envelope. This single factor is key to removing the ambiguity that plagues current supply chain designs.

Taking a whole system approach enables us to put supply chain process and hence performance at the heart of the design. Focussing on process and performance enables and alignment to the purpose and consequent design principles for the system.

Rather than being geared toward unclear targets of improvement, the system can be targeted to meet real supply chain performance metrics such as accuracy, speed and volume.

Recognsing the process backbone of the system allows effective design and implementation of the enabling elements such as technology, organisation, and finance.

Finally, having a top-level system architecture doesn’t mean you have to change everything simultaneously, Rather, it allows you to change elements within it, in the knowledge that they are moving in the correct direction and are adhering to the strategic principles. Doing so allows rigorous prioritisation of investments, the removal of duplications and provides a framework for discussions with industrial partners and allies alike.



2

Implement detailed planning and forecasting

The architectural approach to supply chain design will reveal what we all know—that the defense supply chain is a complex system designed to match supply with demand. In matching supply with demand through time and across extended distances, it is vital to have accurate detailed planning and forecasting.

Current planning and forecasting approaches suffer from several drawbacks. They are often very financially focussed, tend to be retrospective, are frequently high level rather than line level detail and they are not always supported by core information systems. The history behind this will vary from nation to nation; however, the peacetime view that next year will look much like last coupled with low adoption of Sales and Operations Planning (S&OP) and Integrated Business Planning (IBP) in government contributes to these issues. In addition, there is a cultural element that the ambiguity of supply chain planning suits all parties.

The ambiguity between front line commands, budget holders, purchasers and industry enables flexibility but also forestalls a reckoning with the actual requirements and costs of a fully ready supply chain. If nations are now genuinely preparing themselves to have forces and supply chains that are sufficiently capable, credible and communicated they must embrace detailed planning and forecasting to facilitate:

- stockpiles capable of meeting the requirements;
- enabling infrastructure and systems that are designed and scaled correctly;
- resources that are scaled and skilled appropriately; and
- the industrial base prepared to build stockpiles and sustain a fighting force.

Planning and forecasting needs to be built over three distinct time horizons; the immediate term - force generation and operations; the near future—meeting the readiness plan and integrating new capabilities; and the longer term. Such staging is necessary to ensure that new capabilities are tailored for warfighting advantage, affordable and integrated into the broader plan.

Removing ambiguity from planning processes will also an enable effective balancing of investment decisions when finance is constrained. In that case, the approach then needs to be able to deliver the best capability for the money that is available.

Driving collaborative planning and forecasting with suppliers will also enable investment by the industrial base as well as assist with reducing costs and improving overall supply chain performance and resilience.

3

Secure Supply

In recent years, extended supply chains, increased volatility, scarcity of supply and political unrest have all made the system fragile. And, the scale of perceived conflict has contributed to the systemic stress. As a result, nations must take a far more assertive position on securing the supply of equipment, components, materiel

and raw materials.

A key first step is a focussed defense industrial strategy derived from the operational requirements, economic desires, political aims and domestic capabilities in critical areas and innovation. Under an architectural approach, decisions over sovereign capability and required domestic capacity must have supporting clarity of requirements, commitments and commercial enablers. Segmenting the supply chain between domestic sources, international allies and broader international providers enables us to understand the key enablers in the systems and exposes where risks lie and what mitigating actions must be taken.

Securing supply can take a range of forms including stockpiling, dual sourcing, use of commercial off the shelf (COTS) items and long-term arrangements with sources whether they be businesses or nations. They should also include innovation to find alternatives, reduce consumption and fully exploit recycling in situations of scarcity. Investment in critical suppliers is also an essential component of securing supply.

A strategy to build resilience in the supply chain must also consider how the industrial base is woven into the fabric of the defense ecosystem. This needs to go beyond transactional contracts and tie in the physical supply chain, capability, capacity and information environments. In extremis the industrial base tends to get integrated too late through government direction and even nationalisation. Such actions should be pre-empted in the near term by creating shared user networks enabled by information creating supply chain resilience and transparency.

While the monitoring, management and mitigation of risks is key to achieving resilience in the supply chain, recent efforts appear overly focused on the monitoring elements. The emphasis needs to be on dealing with strategic issues and understanding what levers are available to defense in a more tactical timescale. When supply chain interruptions occur there are very few actions that can be taken unless defense has pre-configured alternatives and the ability to directly understand the implications and activities required.

4

Transform Procurement

Late running, over cost and underperforming procurement projects are a theme across geographies despite repeated reform and transformation efforts. There are several approaches that can help genuinely improve performance.

A large proportion of current contracts are awarded without competition and focus on transferring cost risk to the supplier. We believe that different contracting approaches with a clear focus on outcome performance and the correct industrial strategy will yield the improvements required.

Investment needs to change to address the current shortfalls. This requires far greater involvement from private finance to “prime the pump” and for private equity to have greater access to the sector including the Small and Medium Sized Enterprises (SME) and academic environments. Strategic and deliberate investment programmes in key primes are also crucial to success.

Ensuring performance is improved and maintained requires a much greater emphasis on supplier management - beyond contract management. Governments need to leverage their commercial influence across their portfolios to drive performance, accountability and value for money.

Finally, enabling flexible and accelerated procurement approaches and acceleration through streamlined, standardised and technology enabled processes will reduce timescales, and improve efficiency and operational readiness. Flexibility to embrace evolving threats and technology advances is required to facilitate an agile and dynamic supply chain that can deliver value for money. In their recent support for Ukraine, many nations have reduced procurement lead times and have made iterative innovation the norm.

Defense enterprises need to look at these models and scale them where appropriate. We will explore the procurement topic in more detail later in this series.

5

Innovate front line logistics

The transparency of the battlespace is creating a much more mobile and dispersed environment that logisticians must satisfy. At the same time the spatial boundaries of war have blurred with cyber and economic threats able to act across the supply chain.

Some simple deductions for logisticians to draw might include evermore dispersed last mile fulfilment challenge, a more dangerous support environment and risk of attack at greater depth in the supply chain. Tackling these challenges will require innovative approaches to front line logistics and engagement of operators in the design and delivery of new solutions. Obvious innovations such as uncrewed (UXS) delivery systems need to be delivered rapidly, and their implications across the supply chain must be understood.

Innovation of technologies at the front end of logistics will drive significant change through the supply chain and further force the removal of ambiguity and wider digitisation. It will also impact seemingly mundane but critical factors such as packaging, form factors and maintenance scheduling. For instance, a move to UXS replenishment would drive a need for weight and size accuracy in information systems, and precision of replenishment quantities. Currently few defense organisations would trust their core systems with this level of accuracy. The new battlespace demands levels of precision and accuracy in our logistics systems that need to be addressed now.

The new battlespace in other ways is just like the last one and the logistics system needs to be designed for volume of materiel and transactions. This impacts network design end to end and needs to be considered in all aspects of warehouse and transport design. The additional need for deep resilience should also lead organisations to consider broader shared user networks of inventory holdings back into the industrial base.

6

Design and build for support

The changing nature of conflict and the support environment means that a new emphasis should be placed on designing military equipment and materiel with its support as key design criteria. In real, high tempo, large scale conflict supportability will become the key driver of cost and availability of platforms.

Defense organisations need to embed supply chain and support thinking in the acquisition process from the outset so solutions are designed to supportability criteria. This is not simply a matter of governance but also one of culture and finance as we move away from years of peacetime in which exquisite, expensive platforms have regularly tradedout long term support benefits for short term capability and in year cost achievements.

Designing equipment to reduce the support burden must also drive us towards standardisation and interoperability. In conflict where most nations will be part of wider alliances it will be important to be able to utilise the supply chain components of allies to enhance the forces effect. Therefore, design for support must be considered within the whole system approach and reflect interactions with other nations through industrial strategy.

7

Be pragmatic in information enablement

Most nations' supply chain systems reflect organic development along organisational and programme lines over the last 40 years. The landscapes are fragmented, layered and in many cases based on old approaches. Attempts have been made in some nations to implement Enterprise Resource Planning (ERP) systems to bring a more integrated approach but often implementations have been lengthy, incomplete and have failed to deliver on many of the promises.

Given the time that large scale information system (IS) transformation takes we believe that a Defense organisation should start by making the most of what it has. Defense organsations have access to cutting edge analytics tools and sensor data but regularly fail to exploit this. For instance, land vehicles have been equipped to provide Health and Usage data (HUMS) for many years but this is rarely used to improve supply chain performance.

There is also an urgent need to rationalise and standardise complicated systems environments. Rationalising a portfolio based on the overarching supply chain architecture enables tough prioritisation and standardisation to facilitate interoperability with industry in the rear and allies in the operational environment. End to end collaboration will only be achieved through simplifying the landscape and aligning it, and while this will be complex, a focus on core processes such as planning and forecasting should provide the foundations on which to build.

Our experience suggests that nations should apply innovative technologies to accelerate integration, automation and analytics above all else. Monolithic solutions are no longer required to drive integration, and new technologies need to be applied to help stitch disparate parts together. At the same time automation should start by supporting the drive for data hygiene and accuracy which underpins the analytics that will enable us to plan, forecast and enhance supply chain performance. If our processes are to be less ambiguous the data will have to be accurate.

The IS landscape reflects the fact that change is expensive, is perceived as high risk and generally have too many stakeholders to please. We are now at a point where the costs of supply chain failure are much greater, the risks will only increase, and the operational imperative brings clarity to requirements. Defense organisations need to address the information shortfalls now because it will only become more difficult in the future.

8

Align organisation, finance and process

One of the greatest challenges that defense supply chains face is organisational. There is a long time recognition that defense supply chains have both end-to-end and through-life processes however few Ministries of Defense (MODs) have configured their organisations to reflect this. In most cases vertical organisations sit across these horizontal processes. This structural issue misaligns and obscures responsibilities and accountabilities for supply chain outcomes. Where this is recognised, attempts are made to "paper over the cracks" by assigning responsibilities to relatively meaningless and unempowered titles such as Functional Owner, Process Owner, Sponsor, Champion etc. These roles do not fix the genuine accountabilities in the system.

These organisational challenges are compounded by financial responsibilities aligning to organisations. This has two notable impacts on supply chain development and optimisation. First, investment decisions tend to be localised and made only when benefits fall inside the organisational boundary. A good example being logistics IT projects that focus on replacing ageing capabilities not to improve supply chain outcomes but to reduce IT costs or prevent IT failures. Second, cost savings are also driven inside the organisational boundary. The government tendency to make incremental cuts within operating budgets means that savings are taken locally whilst the consequence is felt elsewhere, hence we see reductions in purchasing teams meeting local headcount objectives while pushing up the purchased price due to a lack of negotiation skills.

Radical organisational and budgetary change is difficult in large bureaucracies and most MODs still have some way to go to recognise the fundamental importance of their supply chain to their fighting capabilities. Whereas corporate enterprises have long recognised the C-suite imperative around supply chain this is not the case in defense. As a minimum defense organisations need to focus genuine top-level accountability for supply chain outcomes (e.g. availability, accuracy, cycle times and costs) in as few roles as possible. Where organisations cannot be changed then the system needs to be incentivised to generate the correct outcomes, whether that is at an individual, organisational or financial level.

MODs should bear in mind that however difficult aligning responsibilities, accountabilities and budgets appears to be today a conflict at scale will force these things rapidly and they should take the opportunity to get their houses in order Ahead of this necessity.

An end to ambiguity

For decades defense supply chains have survived in a world of ambiguity where a lack of commitment to inventory levels and availability targets and their relationship to genuine force readiness has provided commanders and politicians with financial and operational flexibility. Operational forces survived these circumstances through endless adaptability, determination and innovation. They were also helped by a scale of operations which enabled them to draw on the resources of a much bigger whole to achieve a narrow outcome.

The world we now face, whether in direct conflict or large-scale peace keeping operations, will require transparency and honesty in the supply chain.

The investments to be made are significant and will need to be underwritten with detailed forecasts and plans. The money will not be infinite therefore the balance of investment decisions will require accuracy, trust and a focus on operational outcomes that are understood by the integrated defense planning process. Furthermore, the nature of conflict and digitisation of it and of the supply chain will make accuracy a pre-requisite. The end to ambiguity in the supply chain environment will create some challenging decisions for defense organisations and governments. However, it is the only way that the supply chain will deliver what is required, when and where it is needed.

Where to start?

The imperative for supply chain reform has never been clearer than it is today. Steps are already being taken by governments and industry to address capacity challenges, secure supply, increase resilience and improve collaboration.

However, we believe that firstly this needs to be done in the context of clear design principles and an overarching architecture, and secondly, that progress needs to be made against each element outlined above.

How PwC can help

PwC's defense supply chain, logistics, and operations management capabilities merge deep industry and public sector experience and tech alliance partnerships to help our clients improve the performance of their operations including:

Supply Chain strategy and operating model definition	Capacity and Capability transformation	Design and build of agile and resilient supply chain solutions	Performance improvement through automation and digitisation	Integrated Business Planning	Procurement transformation

Please reach out to us if you would like to explore the topics covered in this article in more detail.

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