DEFEND AGAINST UNCERTAINTY

How intelligent planning reinvents industrial, aerospace and defense companies for efficiency and growth in uncertain times
Reinventing Industrial and Aerospace and Defense Supply Chain Planning

As the turbulent global disruption due to COVID-19 gradually subsides, manufacturing operations resume and supply chains begin to stabilize, planning in the new reality has never been so indispensable for industrial, aerospace and defense companies.

As leaders know, effective planning is not easy. And it’s particularly challenging for industrial equipment and aerospace and defense manufacturers, owing to characteristics that are unique to their business model.

A new, data-driven approach to planning can help companies effectively balance supply and demand and, in the process, generate superior business outcomes.
Complex Programs Create Unique Planning Challenges

While in the short to medium term, industrial equipment and aerospace and defense manufacturers have enjoyed relatively predictable demand, longer-term demand has been generally highly uncertain.

This is due to changes in customer requirements, new regulatory mandates—which are especially influential in the defense sector—and technology evolution that is difficult to predict. In a COVID-19 impacted world, even short-term demand has become highly unstable.

This long-term uncertainty can wreak havoc on products that have very long lifecycles and are built to contracts that typically span years, not months. In fact, to meet customers’ expectations, companies sometimes have to begin ordering long lead-time items before a contract is formally awarded and start manufacturing elements before the full product design is finalized. This can be risky given how much could change before the final product is delivered to customers. For example, regulatory changes could force customers to require additional technical components, or a new innovation may emerge that makes certain spare parts obsolete. Adding to the challenge is the high degree of concurrent and multidisciplinary work that companies must execute to meet customer milestones.

Every product typically involves not only five or six tiers of supply chain partners, but also numerous people and workstreams across companies’ own manufacturing, engineering, and procurement functions. That’s a lot to juggle, and it only adds complexity and risk—especially of nonconformities and poor quality—to what are sometimes several-year builds.

Growth strategies based on aggressive geographic expansion further complicate the picture for many companies. When entering new territories, these companies typically have to establish new local supply chains or assembly capabilities, often as a result of heavy geopolitical pressure. For instance, a government defense contract may call for a certain percentage of materials or work to be sourced from the customer’s country. This injects even more complexity into the planning process because companies might have to find or stand up new local suppliers, which can dramatically change the way the company operates.

All this adds up to a very challenging and dynamic planning environment. It requires companies to coordinate activities across many different stakeholders and functions, synchronize disparate and highly complex materials and information supply chains, and quickly model potential scenarios to optimize the use of limited capacity and respond to disruptions. All this while continuing to pursue their growth goals in a world that has become more unpredictable due to COVID-19.
Internal Factors Lead to Suboptimal Planning and Business Outcomes

Companies are not helping themselves by continuing to rely on traditional approaches to planning that are not agile and dynamic enough to keep pace with markets and customers.

In an Accenture survey of aerospace and defense executives, the following was found:

- **33%** said their supply chain is not flexible enough to provide differentiated offerings and experiences for different customer segments on demand.
- **69%** have yet to prioritize anticipating and reacting to supply chain events to protect the customer experience.
- **Only 23%** are actively building supply chain concurrent planning and execution to transform their existing supply chain into one that drives customer experience-led growth.

Aerospace and defense and industrial equipment companies are typically “program-led” in that they’re organized around large investment programs such as an aircraft type. Therefore they often invest heavily in program management tools which co-ordinate activities across different parts of the program. This typically results in very granular activity planning. However, these program management tools fail to integrate properly with Enterprise Resource Planning (ERP) systems. And they also fail to enable actual operational planning based on supply chain constraints, which is a different capability altogether.

In other words, the constraint-based extended supply chain planning capability “layer,” which is critical to scenario planning, is missing. As a result, companies’ planning processes aren’t equipped to deal with the complexity, uncertainty, and overall level of change that’s become the norm in the industry.

For that, companies require more sophisticated planning tools that support future demand and supply forecasting and modelling of alternative scenarios across planning horizons. Yet companies haven’t invested nearly as much in such advanced planning tools as they have in ERP or program management tools. For example, many companies use simple tools, generally Excel, to model different planning scenarios, and those tools are simply not up to the task. Not only are those tools manual, they also require additional manpower—but they’re also typically based on outdated partial extracts of planning data, which creates significant risk of data errors or misinterpretation and virtually useless scenario models. These tools also lack sophisticated functionality and, because they are “offline”, don’t allow companies to take advantage of any insights they generate because there’s no easy way to incorporate those insights into the existing operational plan. This is even more critical given that only **40% of supply chain leaders say they are building supply chain control towers with agile response capabilities to transform their existing supply chain into one that drives customer experience-led growth.**

This continued reliance on conventional planning techniques and “misfit” tools are leading to poor planning and execution outcomes. Common examples include missing parts or excess inventory, sub-optimal use of resources, engineers not working on deliverables that are critical for on-time production and production working on an obsolete design requiring unplanned rework.

The inability to effectively maintain stability on the supply side and fulfill orders on the demand side ultimately undermines overall financial performance and customer satisfaction. That’s not a recipe for growth, especially in a hyper-competitive market.
A New Approach to Planning

Based on our experience, there are four areas companies should consider to improve planning and business outcomes.

1 Process and Governance

At the most fundamental level, companies need a much more integrated planning process.

In a program-based industry with multiple stakeholders, planning has to span engineering, procurement, manufacturing and the supply chain functions.

It’s not uncommon for procurement and manufacturing operations to focus on their own activities and for the supply chain to be stuck somewhere in between, unable to optimize for the whole so the company can best match capacity with demand. Aerospace and defense executives themselves acknowledge it. In an Accenture survey, 29% cite their operating model or organization structure as a barrier while implementing in their supply chain the customer experience-led value propositions their business developed during 2017-2019.

Only 33% of aerospace and defense executives are actively collaborating to innovate unique customer experiences.

Breaking down internal silos dramatically improves transparency which, in turn, leads to far better decision making. Integration also extends to upstream supply chain partners. At a minimum, the first couple of tiers of these suppliers should be involved in the planning process—or at least exposed to plans—so they can respond effectively and be better prepared for any changes in demand.

A leading developer of defense systems implemented an integrated planning operating model to help the company meet announced customer deadlines, control and reduce costs and inventory, and gain stronger operational discipline. The initiative focused on integrating industrial planning across three different planning horizons: short term (12 to 16 rolling weeks), which is focused on optimizing capacities, stocks, supplies, and activities; medium term (4 to 6 rolling quarters), which involves securing capacities, stocks, and critical supplies and long term (4 rolling years) which concentrates on making major strategic industrial decisions. With this new model, the company has broken through different silos, giving it the agility needed to understand the impact of various changes on the supply chain and respond quickly.

Companies continue to explore innovative process solutions to balancing supply against variable demand. One such solution is Demand-Driven Material Requirements Planning (DDMRP), which positions and manages strategic buffers such as inventory, lead time and capacity, to smooth variability in demand and supply signals and reduce reliance on forecasts.
When it comes to planning, companies need to both break free of the constraints of their ERP system and replace everyone’s de facto favorite planning assistant, Excel.

A variety of more-powerful digital tools are available that can make the planning process far more integrated and agile, not to mention more intelligent.

Companies with the most effective planning support the planning process with a best-of-breed or hybrid approach to technology: a continuum of highly integrated tools that address different planning horizons and activities. That’s not to say the ERP system fades away. It’s still the logical home for “live” program execution and operational plans. It’s just that the ERP system should not be the only tool or used in isolation. For example, a company may deploy some visual analytics capability for key business metrics to give leaders quick and easy access to the information they need to make decisions. For scenario modelling, the company could opt for different software (decoupled from the operational plans) that can help quickly simulate the impacts of various uncertainties—trends, technology developments, supply constraints, or changes in customer demands, for instance—and update its plans accordingly. And it could have a bespoke tool that helps it create dynamic models for inventory policy and parameter setting.

For example, an aerospace and defense company has been working to deploy planning software that features an “automatic scheduler” for aftermarket maintenance. Alternative scenarios for supply constraints and capacity can be loaded into the scheduler, which then automatically and algorithmically produces a plan to allocate demand for maintenance jobs across a two-year horizon. By connecting the scheduler to a financial module, the company could compare different scenarios, choose the best scenario, and commit to it as the “real” plan that’s managed in the planning solution.

In another example, a leading train and rolling stock equipment manufacturer, using an advanced supply-chain planning tool, managed to combine the required focus of a program-led organization with the visibility and efficiencies found in a repetitive-manufacture environment. In a complex situation of unique customer configurations, shared manufacturing resource utilization across programs is optimized based on material availability, meaning that key asset usage isn’t planned until all the required material is confirmed as available. This increased level of visibility, agility and predictability significantly improves shop-floor throughput and customer service, in particular, by minimizing wait times due to material shortages and upstream job slippage.
Data

You can’t talk about improving planning without talking about data. Companies have access to more data, and higher-quality data, than ever before. But they need to collect that data and create an environment that enables them to use increasingly rich data to feed the planning engine. And that’s the challenge.

Aerospace and defense companies continue to struggle to source the right data and put it in a form that a planner can use to create actionable insights. Required data typically resides all over the organization—in the ERP system, the Product Lifecycle Management (PLM) system, and offline—manual spreadsheets or other such tools in various functional siloes—as well as wider ecosystem data sources such as supplier collaboration platforms and risk management databases.

To truly use this widely available yet disparate data, aerospace and defense companies need to create a structured form according to a set of clear definitions for master data for each type, on both the supply and demand sides. Doing so is critical for the analysis that can identify potential supply and demand misalignments that can lead to failures to meet agreed milestones. Yet an Accenture survey found that only one-third of aerospace and defense executives said they have fully deployed governance structures across all company sites for data management for analytics and decision making.

Data quality is also important. An important tool that improves data quality is Robotic Process Automation (RPA), which—in addition to generating significant efficiencies—can help bridge the various planning tools and technologies companies use, decoupling them from the ERP system without adding manual interventions, which are prone to creating data discrepancies.

A US defense contractor worked with Accenture to pilot and subsequently quickly scale a suite of RPA bots across a number of use cases to automate myriad time-consuming, data-intensive tasks across the supply chain. For instance, one bot is responsible for navigating SAP, automating the documentation process and sending records to buyers. Another oversees submitting information on defects to suppliers and updating the ERP system with the RMA number that’s sent back. A third ensures lead-time accuracy by comparing promises to actuals and using that information to determine schedules for parts. These and other bots dramatically reduce human handling time, effort and error, cut cycle times and improve material availability. By their fourth year in operation, the bots collectively returned more than $100 million in net run-rate savings.
Finally, the cadence with which data is refreshed is critical. Different horizons of planning—short, medium, and long term—each require their own refresh cadence. Aerospace and defense companies need to set up a refresh process that is appropriate for how far forward they are planning. For example, more frequent refreshes for short-term planning and fewer refreshes for longer-term horizons. With the right data in the right structure, aerospace and defense companies can perform scenario modelling to understand what it’ll take to meet various changes in demand given certain supply and capacity conditions.

One company, for instance, found its salespeople committing to certain delivery dates to their clients without first checking with the operations department to see if those dates were feasible. This put operations in a real bind when trying to figure out how, or even if, the company could fulfil those commitments. Often, operations determined it could not. With a scenario modelling tool, using the right supply and demand data, operations can get involved with the salespeople early and quickly model—within a day—what salespeople want to propose to the client to see. For example, if it’s feasible and what exactly the company needs to do from the supply side to make it happen. For example, line up different suppliers, create another assembly line or build a new plant.

The same company also used analytics and simulation to optimize planning and scheduling and improve plant design. Doing so led to a **50% reduction in time buffers along the critical paths of assembly; synchronization of the different assembly lines and more than a 30% increase in capacity utilization.** These improvements helped reduce lead time by 78% and missing parts by 73%, while boosting productivity by 33%.

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As companies continue to reinvent their supply chain planning capability, they’ll need a very different set of skills.

For starters, they’ll need to build comprehensive planning skills, supplemented by supply chain architecture skills such as the ability to work across silos to understand the downstream consequences of planning decisions. They’ll also need to increase their “digital fluency” within planning, specifically to take advantage of the insights that analytics can unlock from data.

Companies can respond to the skills challenge in several ways. Of course, training existing workers in new skills is one important step, but it won’t solve the problem completely. Training must be augmented by a strategic approach to recruiting that identifies and brings in the required skills. Ecosystem partners, as well, can be important sources of skills that aerospace and defense companies have trouble building or bringing in on their own. Leveraging third parties’ skills can be an easy way to fill key skills gaps of all kinds and is often less expensive than training or hiring.

One major US-based global aerospace company, for instance, is doing just that. Rather than invest a lot of money in building their own analytics skills and capabilities, and having to continually ensure those skills are current, the company is buying planning analytics-as-a-service from Accenture. The company was struggling to adhere to its engine production schedule and serve the aftermarket due to parts unavailability. By using analytics-as-a-service to analyze 20,000 SKUs across 25 stocking locations in one country, the company improved engine assembly on-time completion by 14 percentage points, reduced late parts by 2%, cut aircraft on the ground (AOG) turnaround time from 25 hours to 11 hours and increased customer service levels from 59% to 93%.8
Where to Start

How can leaders get moving on reinventing supply chain planning to improve business outcomes?

To start, they need to confirm which planning decisions the company must make at which levels of the organization, within what time horizon, and with what information. This will establish the scope and context of any subsequent initiative.

Next comes the all-important data sourcing and analysis. After sourcing required data and categorizing it in a master data structure, the company can then apply analytics to provide deep visibility into its operational performance and target high-value areas.

Third, leaders should prioritize mitigating the following pain points to maximum initial business impact:

- Areas with the largest imbalance between supply and demand such as parts supply, engineering planning, manufacturing/operational planning and execution planning.
- Areas where these imbalances exert the largest impact on planning and business outcomes.
- Areas where the root cause of planning issues is a lack of collaboration among organizational silos.

Finally, leaders need to establish the governance, resource with requisite skills such as data and analytics, and tools required to embed new ways of working and sustain the journey toward an agile, data-led planning organization.

For industrial and aerospace and defense manufacturers, planning is never easy. And it’s only harder with the global economy now in uncharted waters as a consequence of COVID-19.

A data-driven, scenario-based approach to planning gives companies the insights and flexibility they need to more deftly deal with uncertainties and unexpected changes across multiple planning horizons, and improve their overall business performance.
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