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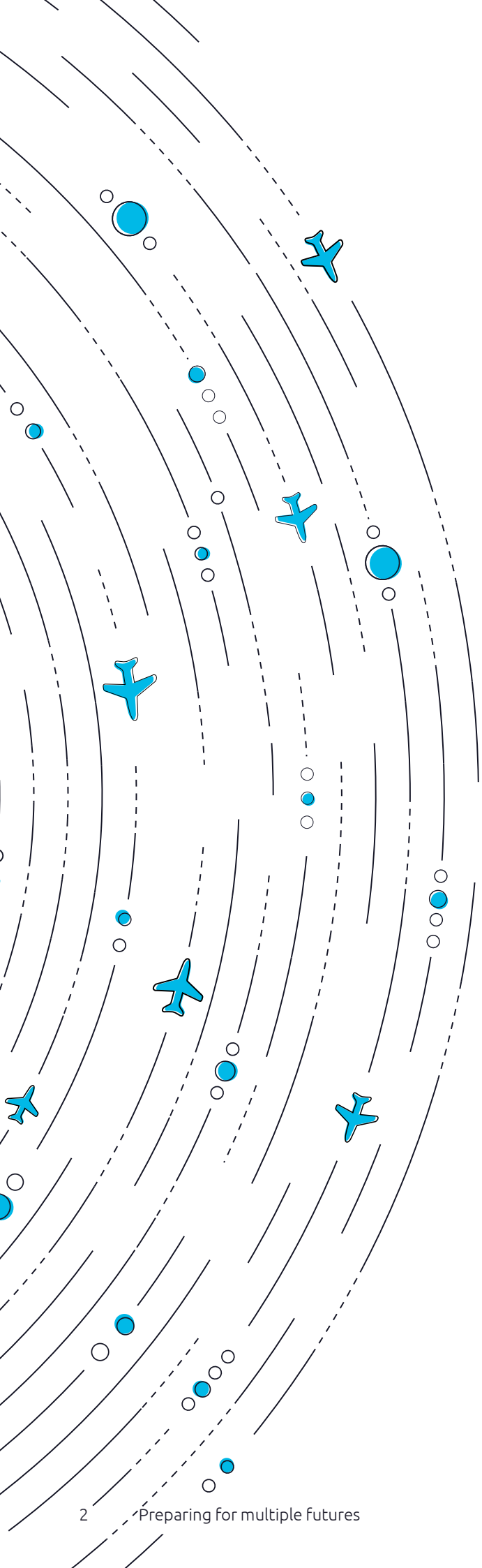
PREPARING FOR MULTIPLE FUTURES

Crafting a multi-faceted transformation agenda for the commercial aerospace industry



How the commercial aerospace industry can craft a multi-faceted transformation agenda to accelerate and secure deliveries, build resilience, achieve sustainability objectives, and accelerate time-to-market.

The civil aerospace industry is entering a new era of huge growth. The urgent need to ramp up production coincides with an increase in competition from emerging markets as well as a backlog of existing orders. At the same time, an increase in fleet retirements and mounting pressure to decarbonize is making speed to market even more critical for traditional original equipment manufacturers (OEMs). With the market expecting to need more than two thousand new aircrafts per year for the next 10 years, the delivery rate should increase by more than 60% in the next three years.

But the race to market is not a straight line. When crafting a transformation strategy, OEMs need to address these different and, at times, competing priorities. They must account for constantly and rapidly evolving landscape dynamics. They must minimize disruption from external forces such as geopolitical issues, supply chain disruptions, raw materials shortages, shifting customer expectations, new energies, and new regulations. As a result, OEMs must fully reimagine traditional Engineering, Manufacturing, Logistic and Service practices, as well as reevaluate and adapt underlying operating plans, investments, and resources.

In this context, we see that the commercial aerospace industry cannot be singularly focused on creating a production plan based on the current environment. Rather, they must embrace a multi-faceted transformation agenda, building resilience throughout the business and across the supply network so that they can not only succeed in the short-term – but any scenario the future may hold.

Intelligent Manufacturing and Supply Chain: Increasing production and improving resiliency, enabled by digital continuity

The civil aerospace industry experiences a major disruptive event every 5-7 years. Practically speaking, this means that while many OEMs are focused on COVID-19 recovery and managing surging fuel costs, they should also be preparing for the next wave of disruption.

To respond to the challenges of today's landscape and weather the unknowns of tomorrow, one area where OEMs need to focus is on developing and advancing digital capabilities related to the product development lifecycle, including manufacturing. This will not only enable them to accelerate current production timelines and improve time to market, but also allow them to quickly scale production up or down based on real-time demand or adjust schedules due to delays and disruptions within the supply chain.

The industrial agility borne of intelligent manufacturing is enabled by digital continuity, the communication framework that connects a manufacturing company's value chain. Through the use of multiple digital threads, organizations can integrate Engineering, Manufacturing, Operations, and Service into a seamless flow, allowing program managers to have real-time information about product and service lifecycles.

It is through this enhanced data visibility, data access, and data sharing that OEMs can unlock new use cases throughout the business, such as:

- **Product development:** Using historical product and customer data to understand when and why product failures occur and determine how to proactively address those issues
- **Forecasting:** Leveraging digital twins to enable advanced scenario planning and support more frequent and accurate demand forecasting
- **Inventory optimization:** Improving visibility within the supply chain and partner ecosystem to ensure optimal inventory levels are maintained
- **Enterprise and extended operations:** Establishing a single source of truth platform for the organization through a trusted, secure data system and collaboration hub for internal and external stakeholders
- **KPI analysis:** Enabling a deeper, more nuanced view of all KPIs, as well as their interdependencies for the enterprise and its suppliers
- **Compliance:** Simplifying and streamlining compliance processes through clear, accurate, timely data and automated reporting, while reducing the carbon footprint

When considering digital continuity, it's important to note that the capability is not singular in nature – nor does it pertain exclusively to digital manufacturing. Rather, data from different systems, functions, and organizations can be gathered and analyzed to create a multitude of threads. These threads can then be woven together, regardless of format, origin, or owner, to create intelligence that extends far beyond digital manufacturing.

Intelligent Supply Chain: Improving supply ecosystem collaboration through advanced data capabilities

One of the major obstacles to both meeting current demand and managing future disruption has to do with challenges within the supply chain. Across industries and around the world, organizations are facing unprecedented transportation disruptions, material shortages, and rising commodity prices. For aerospace manufacturers, this issue is amplified because they rely so heavily on a sprawling, multi-tier network of suppliers to provide critical components, many of which serve multiple OEMs.

This means that the organization's ability to meet production goals is contingent on the performance of the network. The system is only as strong as its weakest link. Put another way, if the organization's partners and suppliers are not able to operate at the pace set by the OEM, then digital investments are of limited value because they cannot be used at scale across the extended enterprise.

In this landscape, there is a need for closer collaboration between multi-tier suppliers and OEMs. As the manufacturer of the final product, it is up to the OEM to orchestrate this network and articulate what capabilities each vendor needs to possess so that they can participate in the digital way of working.

They must also focus on the element of compatibility, by which we mean that even as vendors use different platforms, there must still be a process by which these parties can share data and models in real-time to support integrated simulations. This is the key to being able to build a single trusted platform that enables an end-to-end view that will allow the OEM to orchestrate multi-tier suppliers (considering their specificities), as well as plan and anticipate issues in the global supply chain.

Driving sustainability – at speed and at scale – through digital advances

One central theme running through every transformation program within the aerospace industry is sustainability.

In recent years, the industry has taken clear steps to reduce CO2 emissions through new materials and technologies, extensive use of composite on new generation aircrafts, new engines, aerodynamic performances, and more. At the same time, more needs to be done as the industry faces mounting pressure from consumers and government alike to take bolder, more sizable steps to tackle this critical issue.

Some advancements, such as the use of hydrogen as a fuel source, show great promise in terms of reducing carbon emissions. However, its practical use is likely a decade away (and its scope is yet to be defined), which means that organizations should consider other ways in which they can advance the sustainability agenda. Some areas may include:

- Managing ground traffic through electricity or low-carbon energy sources
- Building efficiency within the manufacturing process as well as through the sourcing of more efficient materials
- Embracing the circular economy, focusing on the dismantling, and recycling for "end of life" crafts
- Exploring the use of alternative energies, such as sustainable aviation fuel (SAF), electricity, or a hybrid model, including mass production at a competitive price, storage, logistics and impact on propulsion systems

Intelligent Industry: Preparing the commercial aerospace industry for multiple futures with a comprehensive transformation agenda

While digitalization – be it through digital manufacturing, next-gen supply chain coordination or advances in low-carbon energy sources – is an enabler of transformation within the aerospace industry, organizations must remember that it is not the solution itself.

As with any digital business transformation effort, the strategy requires equal investments across technologies, business processes, and people. To be effective, OEMs must consider not just the use of technologies, like digital continuity or digital twins, but the processes that will enable their deployment at scale and the training and development of people to ensure their rapid and effective adoption within the organization and across the supply chain.

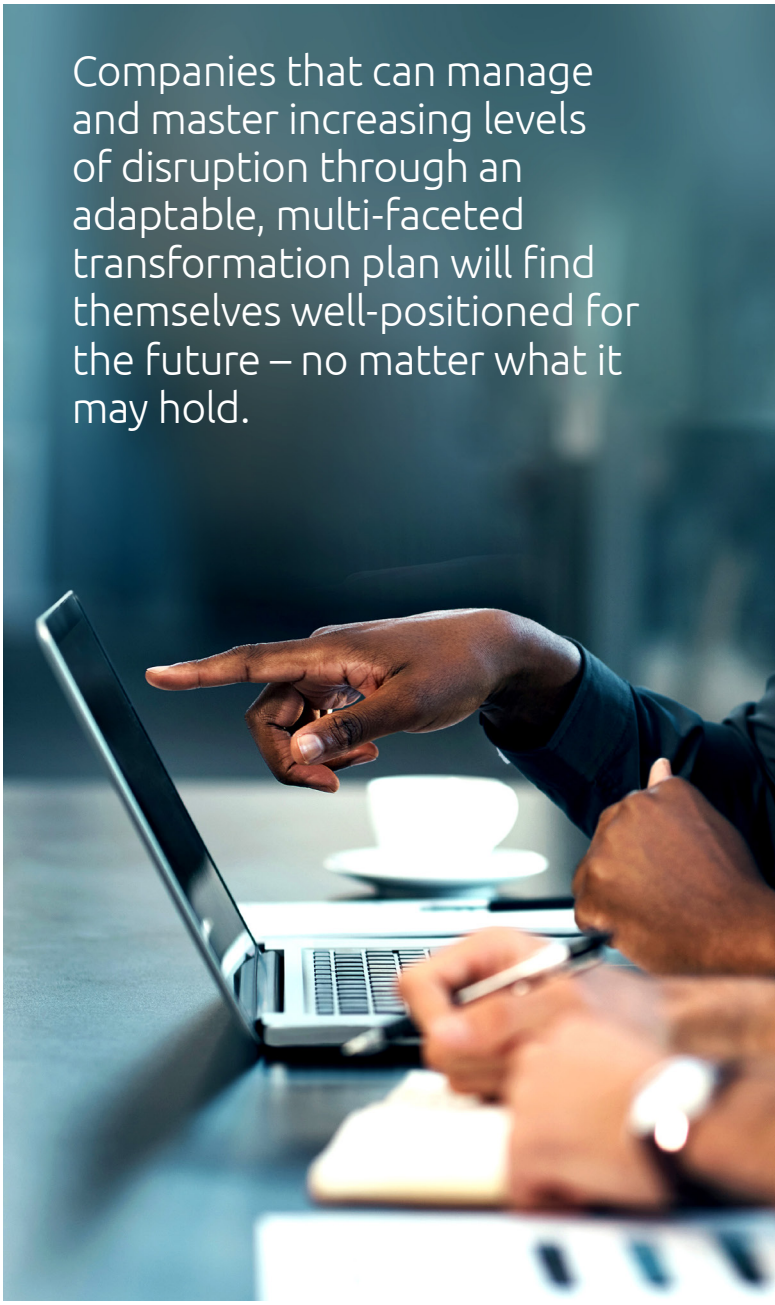
In addition, the OEM and its suppliers may also have to develop more transversal leaders to organize and manage co-design and co-manufacturing activities. Driving the change of existing core business processes and teams will be a critical success factor, and, in some cases, the most difficult to achieve.

For every organization, transformation success relies on people with leadership skills plus the need to on-board extended teams. This will require up-skilling programs (with an emphasis on training industry newcomers) and robust communication among all concerned organizations.

Get the future you want with Capgemini

As the largest engineering services company in the world, Capgemini is uniquely positioned to help companies in the aerospace industry to develop and deploy a comprehensive transformation program. Capgemini offers the aerospace market comprehensive services to support the acute business needs of today while building resilience to weather the disruption of tomorrow.

Our team of 360,000 people, including 60,000 engineers, gives our clients the competitive edge as they adopt and apply emerging digital technologies within their business and across the supply chain. Our end-to-end aerospace service offering, which includes consulting, engineering, applications, infrastructure and cyber, combined with our deep business transformation capabilities, helps our clients reimagine how they will design, engineer, manufacture, and service complex products in a rapidly evolving market.



The future starts today

Over the next several years, the speed and magnitude of change within the aerospace industry will be spectacular. Companies that can manage and master increasing levels of disruption through an adaptable, multi-faceted transformation plan will find themselves well-positioned for the future – no matter what it may hold.

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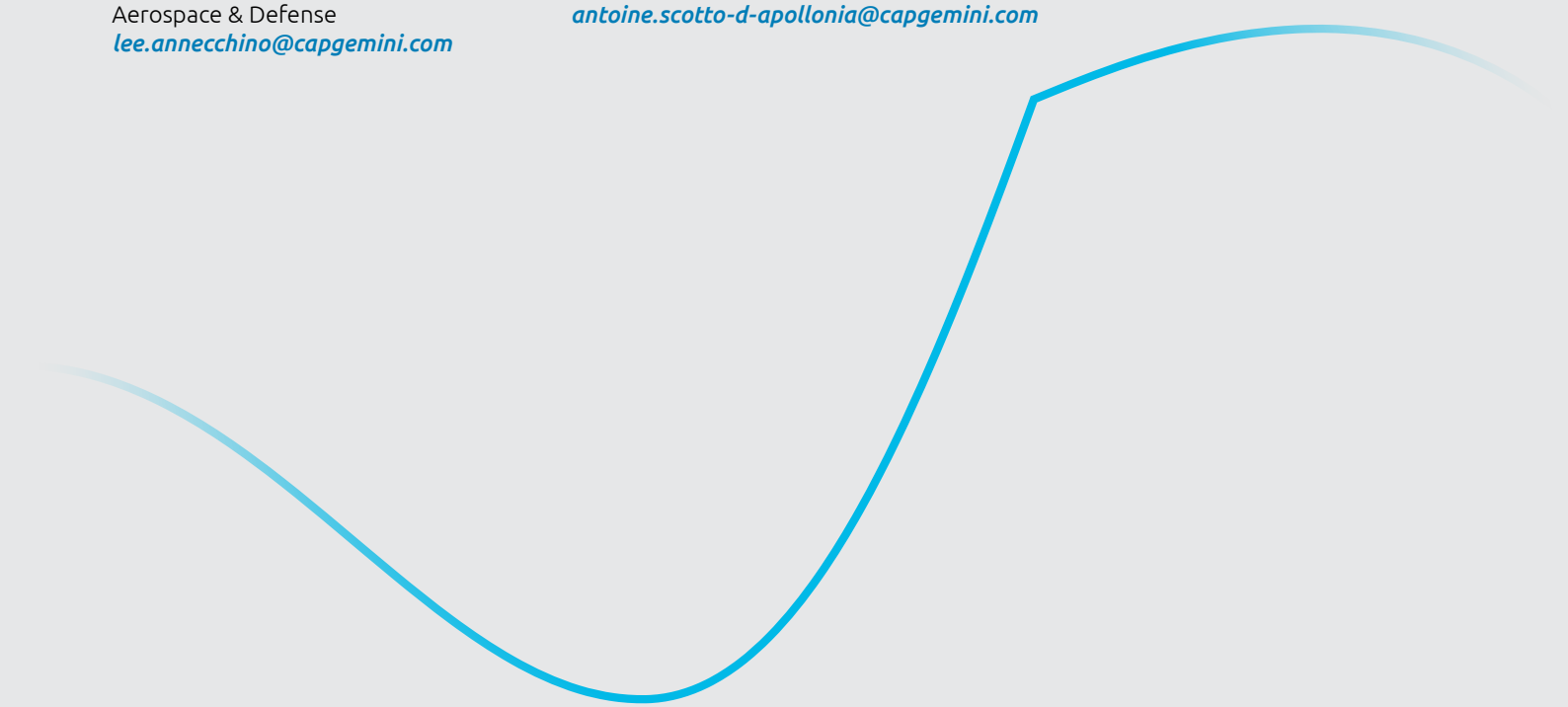

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