Shrewd practices the Aerospace industry will carry through after emerging from a COVID-19 world

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WHITEPAPER

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Abstract

The year 1903 marked an important timeline in the annals of history. The aircraft industry took off and has been flying and evolving ever since. Cut to 2020, and we see that the industry that runs on complex leasing business models, has been put to test, and is practically grounded. For it to take off and operate profitably requires major changes encompassing supply chain management, manufacturing, engineering, time to market, and fleet and staff operations. This paper will analyze the challenges that the aerospace industry will typically face and potential solutions for take-off.

Introduction

Like any other industry, the aerospace sector has, over the last few decades, faced tough market conditions and tremendous cost pressures as customers emphasize affordability over sophisticated features. With the COVID-19 pandemic creating a tough time for all industries including aerospace and defense, independent reports suggest that two major aerospace companies have already declared more than $2 billion in losses between the two and one of them potentially moving ahead to cut their workforce by up to 10% to reduce production costs in the tough battle of survival.

With the struggle the aerospace companies are facing, also comes to fore the entire value chain that, at times, runs hand-to-mouth with a heavy reliance on cash flow and accompanied liquidity challenges. In addition, due to the reduced overall activity, there is a further reduced demand for materials and components. Over and above such unfriendly circumstances, due to the market scenario and the related cost pressures, fuel efficiency and improved flight characteristics have become critically important.

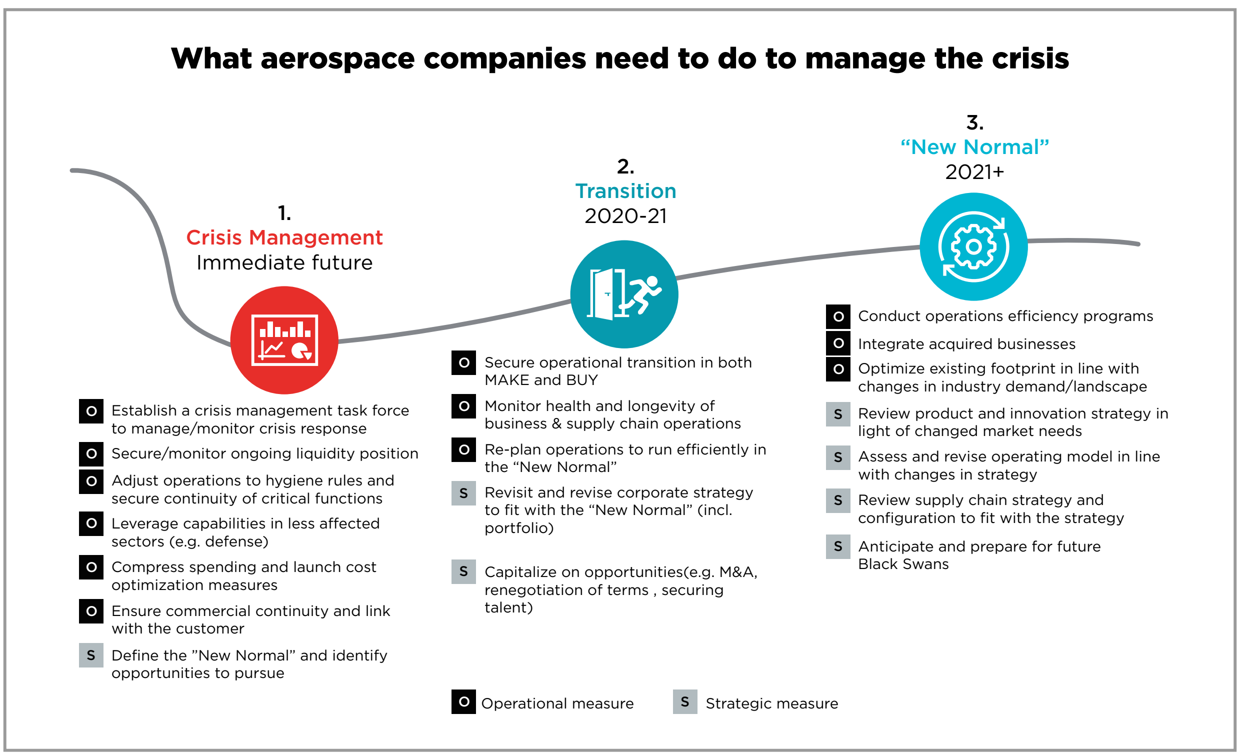

Figure 1: How Aerospace Companies Can Manage the Crisis

Courtesy:
https://www.rolandberger.com/en/Point-of-View/COVID-19-How-we-will-need-to-rethink-the-aerospace-industry.html

Possibilities for the Sector

The options available to aerospace companies and major aerospace players to address the above-mentioned scenarios can be broadly classified under the following:

- Devise ways and means of lowering operating costs (such as through outsourcing functions)
- Reduce/eliminate maintenance capital expenditures
- Take up aircraft weight optimization initiatives, for every kilogram saved translates to several thousands in reduced life cycle costs, through reduced fuel consumption and/or higher load capacity
- Revisit the supply chain through appropriate mapping and try to bring in better coordination and integration
- Move towards product localization, alternative lower cost manufacturing locations and suppliers.

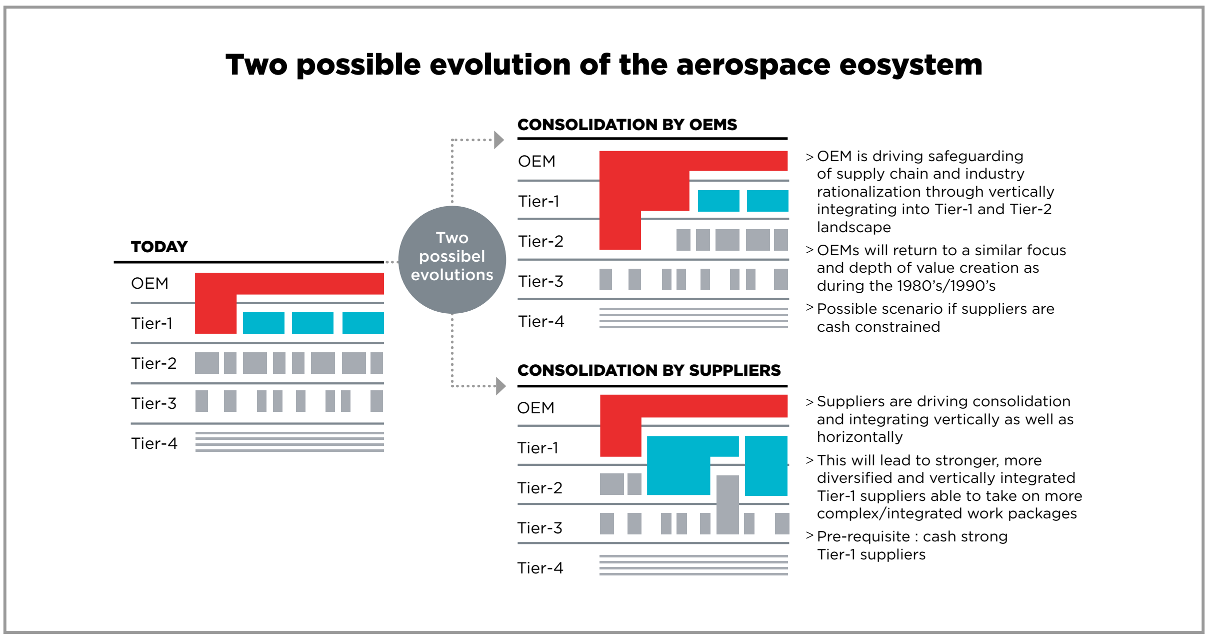

Figure 2: Possible Evolution of the Aerospace Ecosystem

Courtesy:
https://www.rolandberger.com/en/Point-of-View/COVID-19-How-we-will-need-to-rethink-the-aerospace-industry.html

While there are innumerous scenarios that would require change and possibilities as mentioned above, this paper will primarily delve on upstream aspects affecting the industry such as

- **Supply Chain Risk and Associated Cost**
- **Supplier Base and Cost Inversion**
- **Engineering Cost**

Supply Chain Risk

The initial impact of the pandemic even before the entire industry came to a standstill were the bottlenecks. These included logistics, spares, and operations arising due to over-reliance on certain non-strategic geographies. Frequent trade tensions, monopolistic suppliers, and a lack of political transparency have greatly affected the cost and inflated supply chain risks.

These risks continue to exist until paradigm shifts are made. Japan has already made a head start into such activities with near-shoring and moving suppliers to more dependent international partners. While in the late 1980s and 1990s, the Japanese automotive industry set the benchmark for automotive manufacturers in terms of best practices and cost, they will probably show the world the way in the supply chain management segment too. This brings into focus important and simple recommendations that this paper would like to highlight from a supply chain risk and mitigation standpoint.

- **Nearshore from more reliable geo-partners –** This would have the obvious advantages of less time and cultural differences. Moreover, being nearby allows for less expensive and more frequent face-to-face meetings, and therefore increase the productivity of the collaboration.
- **Identify alternate suppliers and practice dual sourcing –** While this may be necessitated to avoid over-reliance on the existing supplier, it also affords the opportunity to look for lower cost supplier geographies.
- **Perform thorough risk analysis –** This will address any potential risks with a supplier and also help to negotiate pricing
- **Update risks based on the geo-political scenario –** This would bring in the element of de-risking through diversity. Although this may sound contradictory to nearshoring, it does work in some situations and can be used very effectively with trade-offs.
- **Track supplier risk –** This may call for defining metrics and tracking supplier performance against them so that when understood by the supplier, performance improvement can be taken up in the stated areas.

Supplier Base and Cost Inversion

Independent reports confirm that there is a $60billion package to support one of the major aerospace industries and its suppliers. While this is indeed critical, the industry must start to self-sustain and weather any future challenge. In this perspective, the OEM and supplier relationship is sacrosanct and can only move ahead with total trust and transparency. One of the reasons the automotive industry is much better suited to such hard challenges is because of their ways of working with suppliers.

Certain recommendations on these lines for the aerospace industry would be to:

- **Develop strategic supplier bases –** This would result in reduced supplier risks, as well as lead to lasting and collaborative supplier partnerships, especially related to critical products or services that could significantly de-stress complex supply chains.
- **Develop win-win cost negotiation strategies –** Successful negotiation results as much from addressing "what's in it" for the supplier as for the depth of understanding manufacturers have of the underlying economics for a given product or component.
- **Deploy statistical costing methodologies for negotiations –** While a conventional should cost approach could bring in the desired results in price negotiations for manufactured i.e. build-to-print parts, precedent-based proposals and regression-based statistical methodologies such as linear price progressions, would come in handy when dealing with purchased i.e. build-to-spec components.
- **Ensure business continuity to suppliers who adopt transparency –** Companies need to promote greater collaboration among their internal teams and with suppliers, while also enabling improved data access.
- **Digitize the Supply Chain –** This enables the utilization of data and development of automation tools for more detailed supply chain management and analyses along with tracking of supplier and consumption practices while offering manufacturers better agility.

Engineering Cost

While there are different facets that affect engineering cost, the aspects that become more pronounced in situations like these, are the impact of design cost due to over-design (leading classically to high weight situations in parts and subsystems), target cost deviations, and variety. While there is this statistic that for a distance covered of 600 miles, low-cost carriers typically spend 6 to 8 cents per passenger mile, whereas certain other carriers spend 15 cents per passenger mile (see Figure 3). With certain restrictions such as social distancing and lower occupancy rules that might kick in, it is essential to lower costs with a view to ensure that demand is retained for the industry functioning and for the OEMs to start manufacturing.

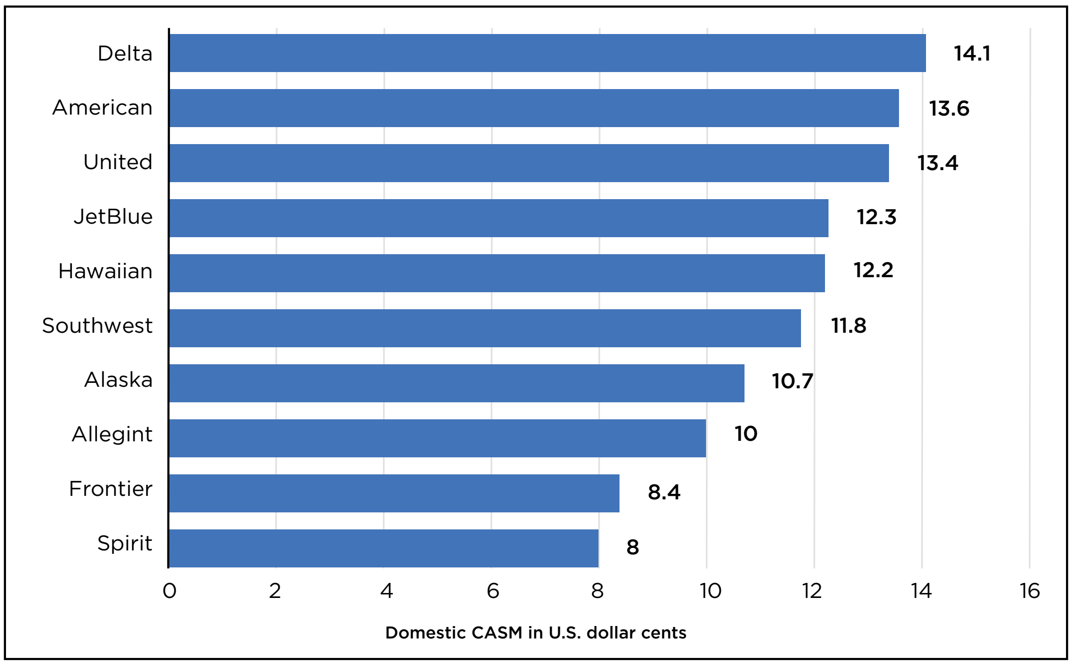

Figure 3 : Cost per Available Seat Mile in the US Domestic Airline sector

Courtesy:
https://www.statista.com/statistics/527881/us-domestic-cost-per-available-seat-mile-by-airline/

With this intent, aerospace OEMs should focus on reducing engineering costs and optimizations through the following methods:

- **Proactive Value Engineering –** Developing value engineering-based solutions that address key recertification requirements characteristic to the aerospace industry. Also focusing on weight optimization strategies would lead to several thousands of reduced life cycle costs, through reduced fuel consumption and/or higher load capacity.
- **Undertaking Design to Cost Programs –** Somewhat similar to performing proactive value engineering, this would involve developing cost-effective product designs through adopting a function-based approach, relentless tracking and working in alignment with sub-system level cost targets, and performing real-time costing through the use of automated spreadsheets and/or commercial costing tools.
- **Identifying markets that will propel business and cater to their cost perspective –** This would warrant identifying specific target markets in line with defined cost knowhow and create customer profiles to better channel-related developmental efforts.
- **Reducing Variety and Tooling Cost –** This can be done through undertaking sub- system and part-level standardization and rationalizations to reduce part and part-variety count, resorting to modularization strategies and adopting modern manufacturing processes for tooling development.

Executive Summary

The aerospace industry, in recent times, has faced tough market conditions and tremendous cost pressures. With the advent of the COVID-19 pandemic, the problems have exacerbated in the form of cash flow and liquidity challenges, reduced demand for materials, and critical need for fuel efficiency.

In this scenario, what is called for is a comprehensive approach to product cost management, involving methods of lowering operating and maintenance costs, adopting aircraft weight optimizations, better integrated supply chain management, product localization strategies, and lower-cost region manufacturing and sourcing. Under these broad approaches, we have attempted to focus and highlight primarily three areas to address, namely, supply chain risk, supplier base and cost inversion, and engineering cost.

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