AlixPartners

CONNECTED AIRCRAFT: HYPE OR REAL GAME CHANGER?

The AlixPartners A&D Minute

2017 was a landmark year in commercial Aviation history. It was not only the safest year ever, but also the year aviation definitively kicked off its digital revolution. Connected aircraft, Industry 4.0, and open data platforms such as AnalytX, Skywise, and Predix became common parlance at the year's biggest airshows.

However, 2019 has been sobering. The recent 737 MAX crisis has prompted new reflection on how planes are designed, how authorities certify them, and how pilots are trained. It has reminded everyone that the number one focus has been and must remain passenger safety.

Naturally, it raises the question of whether the digital revolution could play a role in preventing accidents. In particular, will connected aircraft be short-lived hype or a real game changer to the aviation industry, starting with safety?

A BREAKTHROUGH TOWARD SAFER AIRCRAFT

AlixPartners strongly believes that digital transformation paves the way for real breakthroughs in the aviation and defense industry. Connected aircraft—such as the Boeing 787 and the Airbus A350, and also data-enabled planes such as the Airbus A320 retrofitted to allow near-real-time data exchange—produce millions of data points about equipment and systems health management. Advanced analytics can use these data points to help improve safety and operational performance. For example, live sensor monitoring and data streaming have for years enabled continuous engine and aircraft health monitoring, a real improvement in aviation safety. It provides a much better overview of the state of an aircraft, helping to anticipate potential failure and effect repairs in advance.

Also, data from connected aircraft are already used to accelerate the maturity curve of designing better products with more robust engineering and even more effective maintenance programs, an essential prerequisite to ensure safety. The best example of this is the Airbus A350 that set a new record in the industry by achieving 99% reliability in less than 18 months following its entry into service[1], while the program was engaged in a steep production ramp-up. This success was mostly achieved with continuous flow of in-service data from early adopters, which allowed for early detection, root-cause analysis, and correction. This live feedback loop to engineering has not only resulted in better performing airplanes, but also averted massive and costly retrofits for OEMs.

However, these data-driven innovations may not be helpful in the short-term for the 737 MAX. Although the aircraft has many significant improvements over previous generations of 737s, its cables-and-pulleys technology generates significantly less data than fly-by-wire flight control systems do.

[1] "Probably the fastest achievement, in terms of maturity, compared with competing aircraft or even Airbus's own range" - Source: https://www.flightglobal.com/news/articles/a350-reliability-ahead-of-target-bregier-438095/

A KEY ENABLER TO CREATE VALUE FOR THE WHOLE INDUSTRY

Connected aircraft already provide a wide range of benefits to each segment of the aviation industry (figure 1). Some of the most tangible benefits result from predictive maintenance solutions for airlines[2]:

- Delta Air Lines achieved 95% accuracy in predicting maintenance-related cancellations and reduced their occurrence by 98% between 2010 and 2017.
- EasyJet predicted 31 component failures within just a few months of deploying Skywise, avoiding potential flight disruptions, and has cut delays from technical issues by two-thirds since 2010.
- Cathay Pacific reduced delays related to auxiliary power units by 51% with Honeywell predictive solutions.

FIGURE 1: BENEFITS EMPOWERED BY CONNECTED AIRCRAFT

	AVAILABLE/SHORT-TERM BENEFITS	MEDIUM/LONG-TERM BENEFITS
Airline	• In-flight connectivity revenue stream • Immediate data-gathering and reporting • Live performance and health monitoring • Predictive maintenance and asset optimization • Improved fleet management • Reduced aircraft turnaround time • Reduction of support costs and inventory holdings • Fuel burn efficiency	• Zero AOG • Customized operations and maintenance relying on digital twins • Single pilot/Autonomous flight • Drastic downsize in number of spare aircrafts
Passenger	• Safer aircraft • New IFE, connected cabin • Enhanced customer experience	• Reduced ticket price resulting from optimization of airlines operations
OEM	• Accelerated maturity curve • Competitive advantage • Reduction of support costs and inventory holdings	• Fully transparent supply chain supporting production ramp-up
Supplier	• Production line optimization • Improved product design/maturity • Reduction of support costs and inventory holdings	• Anticipated demand, boosted push sales • Design right first time
MRO[1]	• Real-time issue identification • Anticipated maintenance before aircraft landing	• Major optimization of spare pool management
Lessor	• In depth asset utilization monitoring • Aircraft life traceability leading to improved residual value	• Increased asset lifetime • Reduced lease transition
Airport	• Real-time, seamless flight tracking • Optimized traffic management • Greater throughput	• Boosted revenue resulting from services offering tailored to each traveler based on data collected through in-flight connectivity

1. MRO: Maintenance, repair and overhaul

Source: AlixPartners analysis

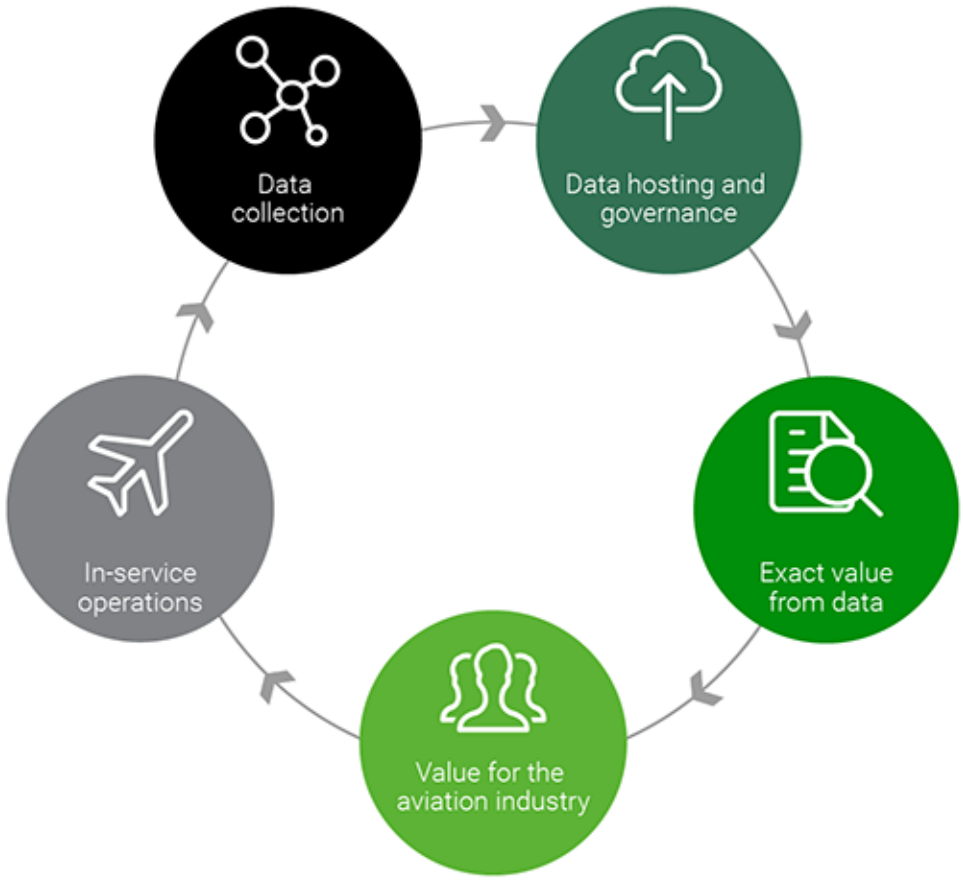
[2] Source: MRO-Network https://www.iata.org/whatwedo/Documents/1400-Martin-Harrison_ICF%20IATA%20Paperless%20MRO%20Conference%20Speech.pdf

Usually, double-digit gains have been measured on most implementation and use cases for connected aircraft, which means there are many opportunities to unlock. In an industry worth more than $1 trillion[3], tens of billions of dollars of revenue growth and cost improvement are within reach.

DISRUPTION POTENTIAL RELIES ON EFFECTIVE DATA GOVERNANCE AND DATA-SHARING

The aviation industry faces several major challenges in the years ahead, and first-movers on the digital journey will hold a long-term advantage. Among the many current disruptive technologies—artificial intelligence, 3D printing, blockchain, to name just a few—connected aircraft and related big data analytics are the only disruptors already at the industrialization stage. Digital innovation no longer happens without data, and connected aircraft yield far more data collected than unconnected aircraft do. The math seems clear, as illustrated by market adoption of Airbus' digital aviation ecosystem Skywise—more than 80 airlines and 6,000 connected aircraft within two years.

FIGURE 2: CONNECTED AIRCRAFT ECOSYSTEM



Connected aircraft is certainly not only a short-lived hype. They have the capacity to evolve into a long-term game changer for the industry, and quickly. Just as with the automotive industry, the aviation industry must first build a culture of cybersecurity overseen by an effective governance to manage data availability,

[3] Including Airlines revenue ($800+ B) and Commercial Aerospace ($300+ B) - Source: AlixPartners analysis, company reports, IATA Dec 2018 data

integrity, security, and privacy (figure 2). Additionally, the industry will have to continue demonstrating value for data contributors. Not all use cases will prove valuable. It will be critical to prioritize innovations that create the most value for end customers. Along with connected aircraft, these are the fundamentals that will convince aviation stakeholders to embrace data-sharing that will fuel disruptive innovations for the future of the industry.

FOR A DEEPER DISCUSSION ABOUT THE CHALLENGES AND SOLUTIONS ASSOCIATED WITH CONNECTED AIRCRAFTS, CONTACT:

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ABOUT US

For nearly forty years, AlixPartners has helped businesses around the world respond quickly and decisively to their most critical challenges – circumstances as diverse as urgent performance improvement, accelerated transformation, complex restructuring and risk mitigation.

These are the moments when everything is on the line – a sudden shift in the market, an unexpected performance decline, a time-sensitive deal, a fork-in-the-road decision. But it's not what we do that makes a difference, it's how we do it.

Tackling situations when time is of the essence is part of our DNA – so we adopt an action-oriented approach at all times. We work in small, highly qualified teams with specific industry and functional expertise, and we operate at pace, moving quickly from analysis to implementation. We stand shoulder to shoulder with our clients until the job is done, and only measure our success in terms of the results we deliver.

Our approach enables us to help our clients confront and overcome truly future-defining challenges. We partner with you to make the right decisions and take the right actions. And we are right by your side. When it really matters.