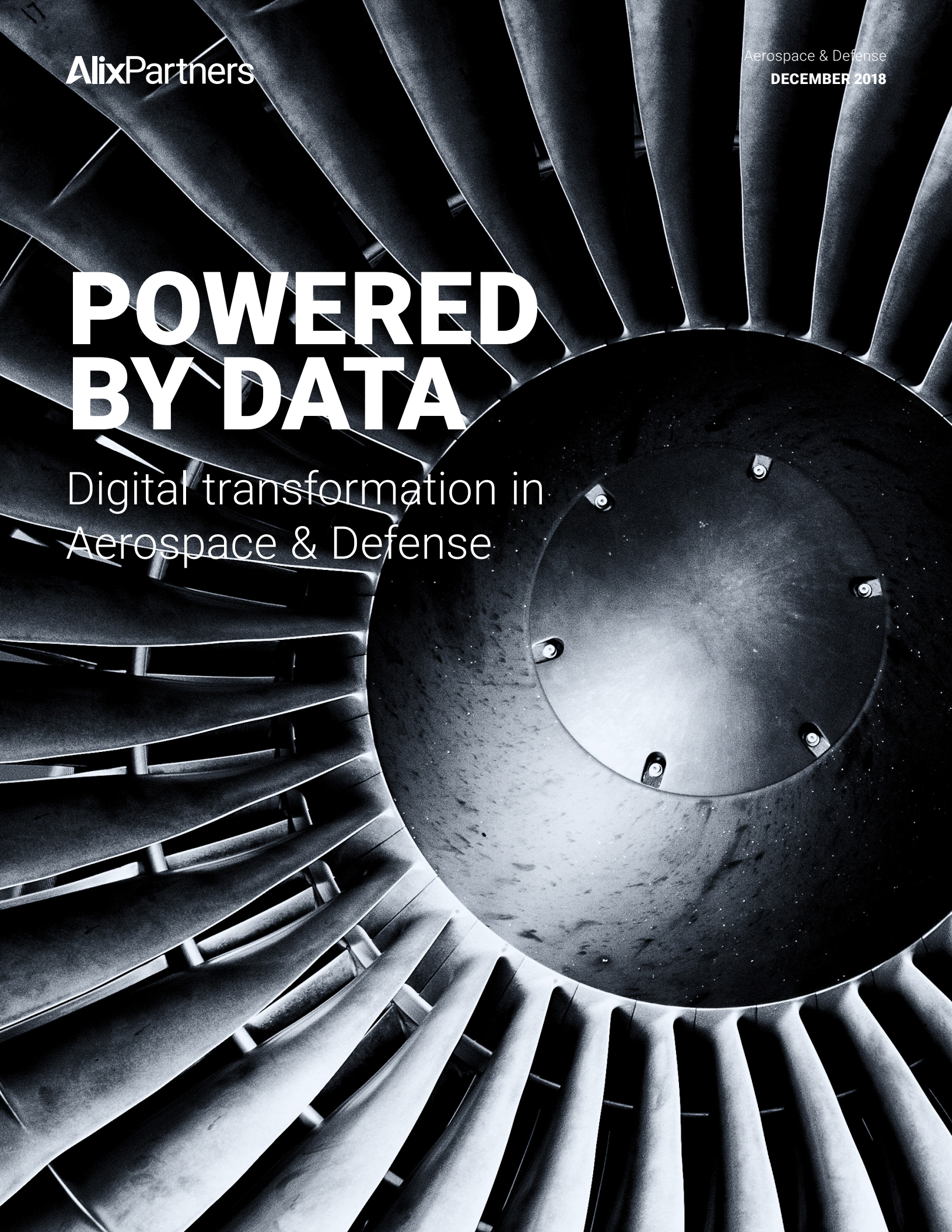
AlixPartners

Aerospace & Defense
**DECEMBER 2018**

# POWERED BY DATA

## Digital transformation in Aerospace & Defense



Digital transformation now sits at the heart of nearly every industry strategy. It enhances and, in many cases, reshapes or disrupts business models, products, services, and operations. When transformation succeeds, its impact on profitability is significant. Our joint study with the MIT Center for Information Systems Research shows that future-ready—meaning digitally transformed—companies are 16% more profitable than their peers.

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In its most advanced forms, digital transformation requires significant investment in new technology. But until companies reach those later stages, technology investments are not the most crucial aspect of their transformations. Far more important are the data a company already has on hand and the skills and capabilities of its people. When the right data flows to the right people at the right time, companies can transform themselves with only modest investment.

Better yet, most companies can realize efficiencies and improve operations simply by pulling, combining and operationalizing the data they already have on hand. To imprison that data in siloed IT architectures and organizations is to deny the business an asset critical not just for growth but for survival itself.

Recent acquisitions in the aerospace and defense (A&D) sector underscore the criticality of data as an asset. The 2017 acquisition of Rockwell Collins by United Technologies (UTC) is a case in point. UTC now easily represents more than 60% of the content of the Boeing 787.[1] By extracting, analyzing, and applying that data, UTC can combine and improve operations, create new value across value chain, and counter Boeing's recent push into aftermarket services.[2]

UTC is hardly the only A&D company to have valuable data stored in several repositories. That data is usually highly siloed, and once those siloes come down, companies can realize the data's value by gathering it and incorporating it into decision-making processes. That is how companies become future-ready.

1. https://airinsight.com/boeings-legal-battles-will-soon-overshadowed-supply-chain-battles-new-utc/
2. Boeing announced in 2017 its intent to grow its aftermarket business to $50 billion from $14 billion in the next five years

# FROM DATA TO INSIGHT

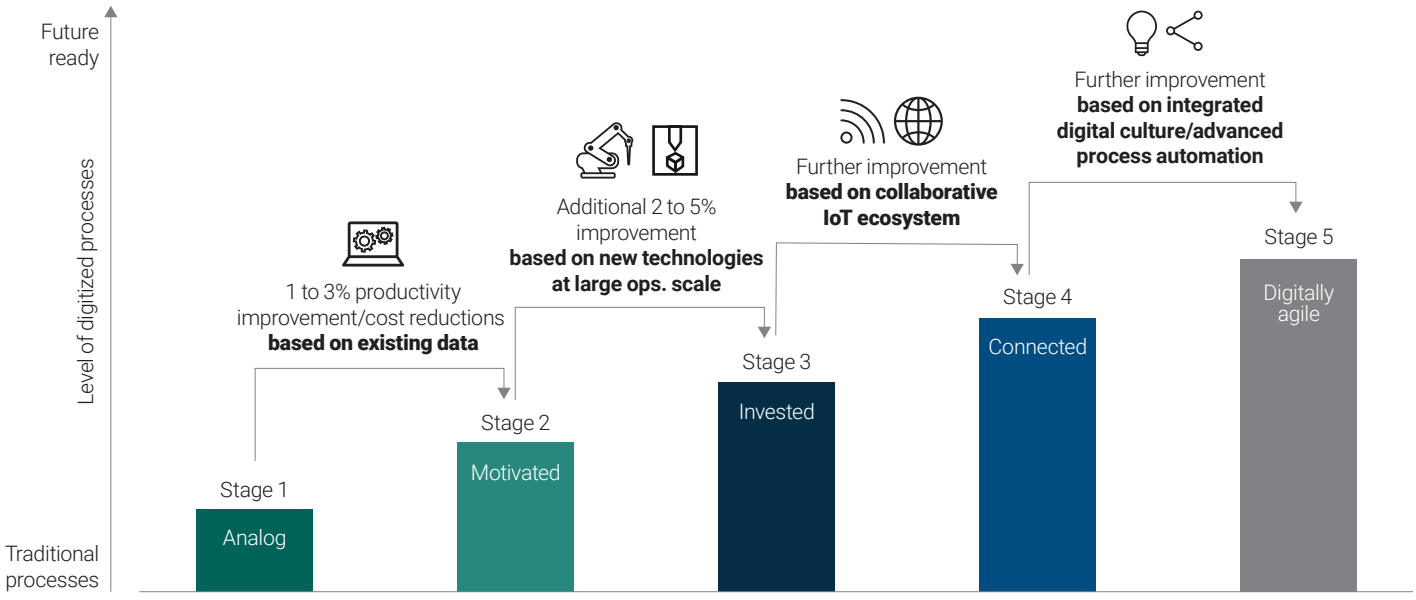
Future-ready companies combine operations excellence with integrated customer experience. Such companies are relatively rare: our joint research with MIT reveals that only 23% of companies are future-ready, while more than half of the companies surveyed have yet to start to improve operations or customer experience. Unlike transformed companies, these non-digital firms still treat data merely as an operational output. By contrast, future-ready companies are, for example, able to combine data from various operational systems with engineering expertise in a feedback loop to help design more reliable systems in less time.

## Digital transformation can easily add 1 to 3% productivity improvement by moving just one stage up, with full potential of 10 to 20%.

Companies that are future-ready don't arrive at that state overnight; they have to climb what we refer to in our digital maturity model as the ladder of digital transformation, journeying in stages from "Analog" to "Digitally agile" (figure 1). Note that it is not necessary to reach the final stage of maturity to generate EBIT and cash-flow improvements. Companies can begin to reap the benefits of transformation once they put in place a long-term plan that features specific initiatives and execute that plan with the full support and visible commitment of the C-suite and a team capable of executing the transformation. Some of these initiatives will not bear fruit for some time, but others can realize low-hanging value within six to nine months or even less, and the value generated can be reinvested in new digital initiatives.

**FIGURE 1: DIGITAL TRANSFORMATION FIRST EFFICIENCIES OF 1 TO 3% CAN BE ACHIEVED BY LEVERAGING EXISTING DATA**

Getting started on the right track does not require costly technology or IT investment



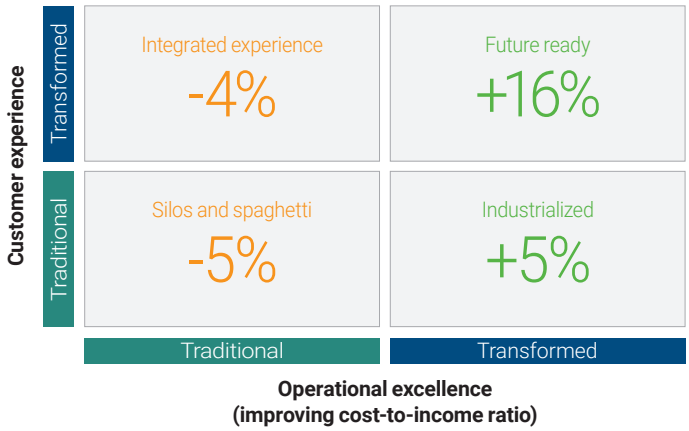

Source: AlixPartners digital maturity model

Companies that climb the ladder of digital transformation and arrive at Stage 5 can unlock a trove of benefits, including new business models that increase revenues and address new markets, cost reductions of up to 20% according to the AlixPartners Benefit model, and a stronger working capital position (figure 2).

## FIGURE 2: THE DIGITAL REVOLUTION WILL BRING REAL BENEFITS TO A&D ADOPTERS

### DIGITAL TRANSFORMATION

Future-ready companies are 16% more profitable than their competitors




### HIGH INVESTMENTS IN DIGITAL TAKING PLACE

Both internal and M&A - but not all are creating value

Investments in digital transformation **up to 1% of revenues** over several years

Many big players have spent billions on digital **M&A**, but **value creation is risky**

### BENEFITS WILL IMPACT THE ALL VALUE CHAIN

Up to 20% efficiency gains for full transformation with significant revenue opportunities for first movers

| | |
|---|---|
| 2 to 7% short-term | Mid-single-digit efficiencies within a year by leveraging better existing data |
| Up to 20% long-term | From 24 to over 36 months full transformation (Stage 1 to 5) |
| New business models | Value creation schemes not yet fully clear, but first movers may hold big revenue advantage |

### DIGITAL LEVERS PER FUNCTIONAL AREA

Specific levers can quickly improve EBITDA

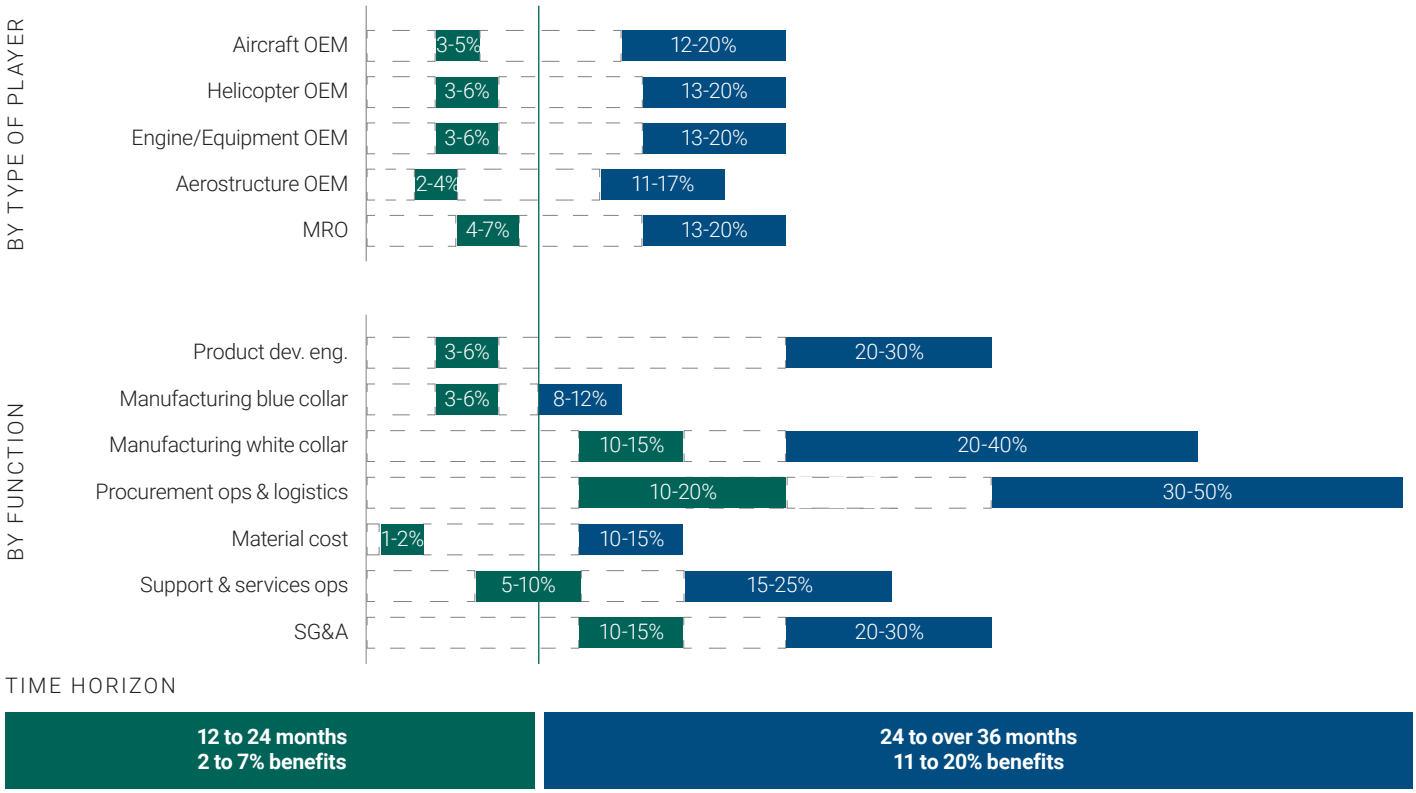
| | |
|---|---|
| Product development | • Software development excellence<br>• Model-based engineering/simulation |
| Industrial operations | • Shop floor analytics<br>• Automation and enhanced operators |
| Support and services | • Digital fleet management: predictive maintenance, in-flight trajectory optimization |
| New business and services | • Platform or usage based new business models<br>• Urban aerial mobility |

Source: AlixPartners analysis, MIT Research

Benefits vary widely by function, by position in the A&D value chain, and by transformation stage. Figure 3 shows the expected range of potential savings under various conditions, according to AlixPartners professionals with extensive experience supporting digital transformations in the A&D industry.

**FIGURE 3: BENEFITS VARY BY FUNCTION AND BY TYPE OF PLAYER ACROSS THE A&D VALUE CHAIN, BUT ADD UP TO 20% EFFICIENCIES**

Savings range sensitivity by type of player and function




Source: AlixPartners digital transformation benefits model

# HOW DATA CAN REWARD A&D PLAYERS

Digital transformations, especially those that take advantage of big data analytics and the industrial internet of things (IIOT), open many pathways to value for A&D. Connected aircraft may offer the most compelling opportunities. By exploiting the IIOT to make full use of the data generated by aircraft systems, connected aircraft can pave the way for new, digital business models.

That is why most of the sector's key players, from primes to tier 1 suppliers to airlines, have launched digital investment programs and large-scale digital transformation projects to develop the ecosystems needed for connected aircraft and other IIOT applications. Prime OEMs, for example, can gain competitive advantage by collecting and analyzing massive quantities of in-service data to accelerate product maturation and enhance aircraft reliability. This capability can fortify prime OEMs' defenses again competitive incursions from new players from China, Russia, and Canada. And all the major industry players, including primes, tier 1 suppliers and major legacy airlines, can bolster their competitive positions by leveraging the IIOT and analytics to significantly reduce service interruptions and increase fuel savings.

That was the motivation behind Skywise—a new data platform for the aerospace industry developed by Airbus—which has pioneered the use of dedicated data-gathering hardware to increase the number of data parameters gathered during every flight to 24,000 from 400. Through October 2018, 28 airlines with a total fleet of around 3,500 aircraft have subscribed to the Skywise platform, thus affording Airbus with vastly improved access to the 21st century's most valuable asset—data. Airbus aims to have 10,000 aircraft under contract by the end of 2019.[3]

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## CASE STUDY

### HARNESSING DIGITAL TO ACCELERATE AIRCRAFT IMPROVEMENTS

A global OEM's leadership wanted to implement a digital transformation to improve operational efficiency and to create new revenue streams. Following an assessment of the aircraft maker's digital maturity, the C-suite, led by the COO and CDO, defined the specific benefits that a digital transformation could deliver for the organization. They proceeded to detail a digital transformation program, focused mainly on operations, with both short-term and longer-term objectives.

The chief short-term ambition was to advance from Stage 1 to Stage 2 by implementing new concepts and technologies that made fuller use of the company's existing data. The transformation team analyzed internal operations end to end to identify pain points, address them, and disrupt ways of working before they were disrupted from outside. To promote buy-in, the CEO placed a monthly governance process at the highest management level—an unmistakable signal of leadership's commitment to digital. The transformation team defined quantitative targets and drew up transformation roadmaps that highlighted the most promising areas to be explored, including connected aircraft, end-to-end digital continuity, adoption of full 3D modeling for every program, digitally enabled design-to-cost, non-conformance reduction, and industrial planning and demand management. The goal of every digital project was to deliver breakthroughs in operational performance.

Among the targets defined for the initiative were shrinking the incidence of aircraft groundings by 30% in two years, cutting by 20% the amount of time required to fix a problem identified after a plane has entered service, and reducing non-quality on the shop floor by 30% percent and the lead time to manage those events by 40%. A key enabler of the digital transformation was the creation of a data lake, populated with data from internal operations, such as engineering and the shop floor, as well as from the in-service fleet and external providers.

### MOVING FROM STAGE 1 TO 3 IN LESS THAN 18 MONTHS

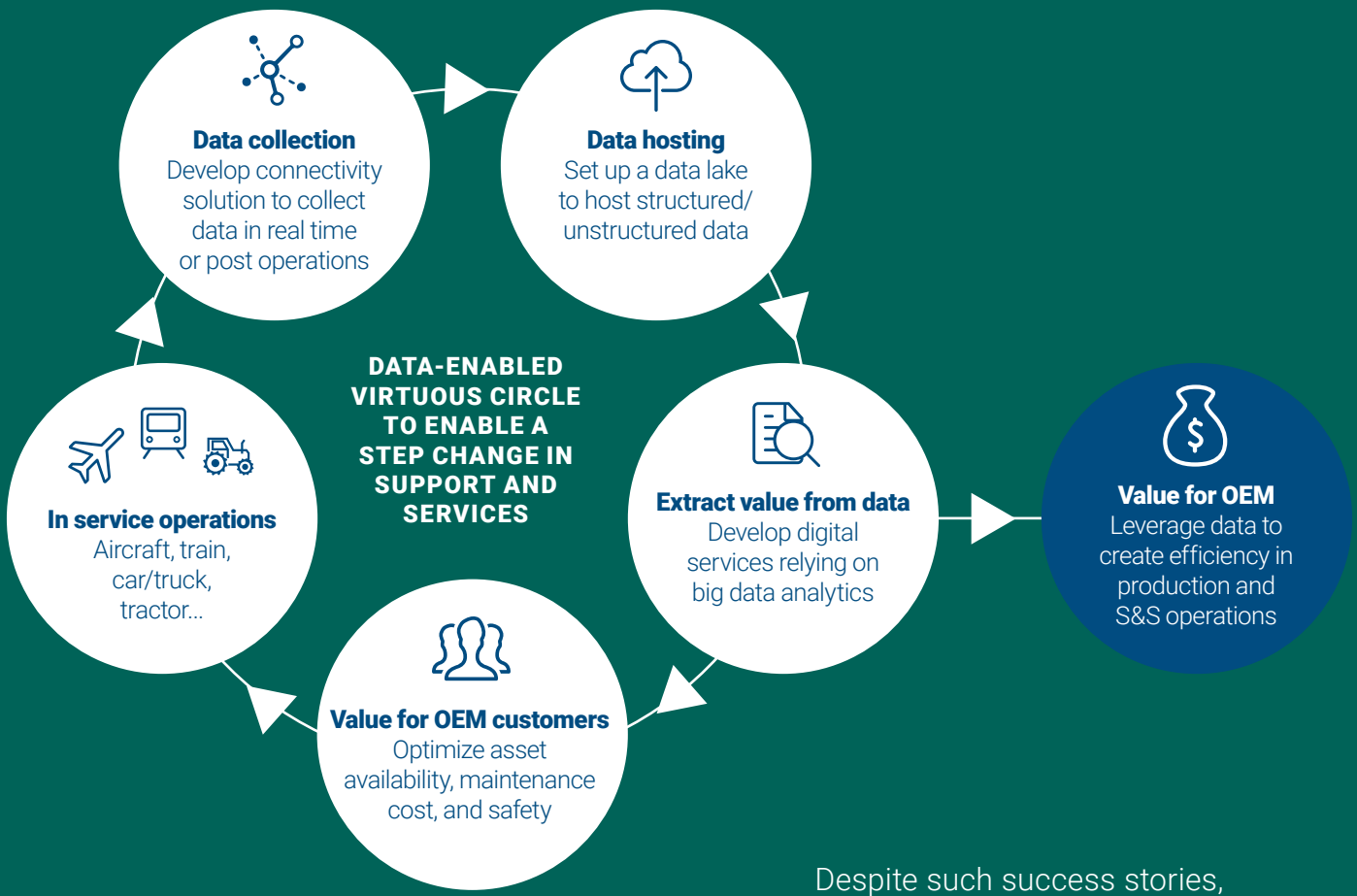
A series of small wins have stoked enthusiasm for the transformation, enabling the company to move to Stage 3, in which digital becomes the core of operations. The next steps of the digital transformation entail building an open collaborative ecosystem that embraces OEMs, tier 1 suppliers, MROs, startups, tech companies, and airlines.

The move from stage 1 to stage 2 is already yielding incremental revenues, which the OEM is reinvesting in the transformation. Ultimately, the company expects to invest up to 1% of annual revenue over a period of several years to finance new IIOT technologies and achieve deep changes in the organization underpinned by M&A and the acquisition of top digital talent.

3. https://www.flightglobal.com/news/articles/airbus-outlines-aggressive-skywise-growth-target-452823/ https://annualreport.airbus.com/interview-dto.html

# THE FIGHT FOR DATA HAS JUST BEGUN

New digital technologies—IoT, connectivity, and big data—enable a step change in support and services




Despite such success stories, value creation remains risky. Those intending to reap the rewards of digital transformation need to invest in all the elements—data capture, telematics, infrastructure, and platforms—that contribute to the virtuous cycle that the IIOT can set in motion.

That investment push is already underway, and much in the form of M&A, which markedly intensified across the A&D industry in 2017.

The motivation behind many of these deals is to control connectivity systems and the associated data necessary to set the IIOT cycle in motion. Simply establishing this virtuous business cycle, however, will not be enough to capture a dominant share of the connected aircraft market. Building an OEM-agnostic platform will be equally important, because most airlines operate mixed fleets and will resist having to plug into multiple interfaces.

### A&D'S FUTURE BELONGS TO THE DIGITALLY ADEPT

The A&D industry stands on the cusp of a new era in which digital transformation will produce significant bottom-line benefits for the entire A&D value chain. First movers could gain a significant revenue advantage over the competition, especially in the connected aircraft market where the exploitation of data as an asset is potentially worth multiple billions of dollars. Only those players that can harness data to realize operational step-changes—and, not incidentally, motivate operators to share even more data—will play a long-term role.

Companies can begin the transformation journey quickly—and with minimal upfront investment—by collecting, connecting, and extracting insights from the data that they already have and working to capture operational data not being collected today. Today's technological advances make this job easier than ever before. Now all that A&D companies are missing are a digital strategy and the execution platform to realize its value.

## CASE STUDY

### DIGITAL TRANSFORMATION PULLS AN MRO OUT OF ITS SPIRAL

A large, publicly-traded aerospace and defense services organization had no time to waste. Losses were piling up on one of its major contracts, as deep-seated operational issues took their toll on efficiency, contract compliance, and customer satisfaction. The program was constrained by archaic processes that relied on tribal knowledge and hampered the full exploitation of available data, causing the team to fall short of its operating goals. Plagued by information gaps in its supply chain that led to parts shortages and overstocks, the company frequently had to resort to "robbing" parts from other programs. And lacking well-aligned metrics and digital decision support, the operations leader often had to rely on gut instinct, leading to actions that incurred unnecessary costs.

The company's CEO decided that nothing short of a full-blown digital transformation would relieve the operational pressures that threatened to cripple the entire company. Working with a small team of advisors, the CEO formulated a phased plan to advance the company to stage 3 of digital transformation, creating a single source of data to feed into analytics tools and enable business leaders to make data-driven decisions.

### STOCKING THE DATA LAKE

Once the full plan had been formulated and the CEO had obtained buy-in from the rest of the senior leadership team, the next step was to reorganize the supply chain operation, placing it under the management of a single general manager responsible for every element of the operation, including planning, sourcing and procurement, and engineering and technology. A team of digital experts gathered information from siloed systems, manual reports, and even employee interviews and pooled it in a single data lake. Analytics engines drew from the lake to support decision-making.

For example, insights gained from data analysis enabled the company to rationalize its sourcing and procurement, segment its supplier base, and automate the procurement process with auction software. Those efficiencies generated substantial savings on its annual parts spend. At the same time, analytics and machine learning enabled the company to offer service and maintenance solutions rather than simply sell parts. This capability helped the company win a contract with a major airline, creating momentum for further sales and boosting the company's share price, which doubled within 18 months of the launch of the transformation.

The company is now on the path to sustainable profitability and efficiency gains. It has opened another new revenue stream by leveraging its data-collection platform to offer predictive solutions to its customers. And it did so simply by making the most of the data it had on hand, with minimal investment and without the expense and disruption of acquiring and implementing a new ERP system.

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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.