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# Big Data: The race is on! But what is the end goal?

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### INTRODUCTION A brief introduction to ICF – Formerly SH&E

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### INTRODUCTION

## For the past three years, the digital race has accelerated in the Airline industry world as all the heavyweights stepping in



### INTRODUCTION

## Several airlines are seeing the first tangible benefits of their aircraft health monitoring trials

### **Results of Delta's Predictive Maintenance approach**

Avoided Engine Events **1,000** (Over 1-year timespan) Delta achieved a 100% completion factor for 241 days in 2017, with a 98% reduction in maintenancerelated cancellations Cancellation reduction 98% (Over 2010 - 2016)

### easyJet

## **31** Events

31 instances of Skywise correctly predicting faults before they occurred in service, allowing the carrier to intervene and remove components before they failed

## **Cathay Pacific**

**51%** 

Cathay Pacific reduced APU-related delay minutes by 51% using Honeywell's predictive maintenance trial program

Source: MRO-Network

### INTRODUCTION

## ICF estimates that digitisation could enable airlines to save in excess of \$5B/year

### Health Monitoring and Predictive Maintenance

Airline Industry savings:



Driven by improved dispatch reliability, No Fault Found reduction, Inventory reduction and Improved labour productivity

### **Delay Reduction**

Airline Industry savings: ~\$0.8B (conservative estimate)

### **Fuel Cost Savings**

Airline Industry savings:



Continuous flight optimisation through live weather updates, speed and altitude optimisation... Improved turnaround process, in-flight routing optimisation



## **Agenda for today:**

Review the current industry context





Implications for your business of this digital race





### INDUSTRY CONTEXT

## The air transport fleet is set to grow to ~39,000 aircraft by 2027, with delivery of ~17,000 "new technology" aircraft over the decade

Maturity,

16' - 26' CAGR

TOTAL = 3.2%

### AIR TRANSPORT FLEET DEVELOPMENT BY MATURITY



#### **OBSERVATIONS**

- Next generation fleet includes 787, A350, A320NEO, 737MAX, 777X, EJet E2, MRJ and CSeries
- This category will grow hugely over the next decade, with significant implications for MRO suppliers

Source: ICF; Excludes Turboprops

### INDUSTRY CONTEXT

## The level of digitization across the nine categories varies; Maintenance is the least digitised activity at this time



#### INDUSTRY CONTEXT

## Within the MRO world, Aircraft Health Monitoring – The analysis of aircraft data health data – is the key initiative

### AIRCRAFT HEALTH MONITORING SCHEMATIC



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## AHM can be viewed as a subset of data management value chain...

## **Aircraft Data Management Value Chain**





#### LATEST DEVELOPMENTS

The MRO industry has entered the 'expand' phase of the digital maturity lifecycle; numerous suppliers are developing digital tools that provide a solution for a single issue





## **OEMs & MROs are embracing partnerships to cover the MRO data value chain...**



## ... Though the level of partnership varies across the various parts of the data value chain

### **OVERVIEW OF AIRCRAFT DATA VALUE CHAIN PARTNERSHIPS**



### LATEST DEVELOPMENTS

# ... in a market already containing 'a lot' of independent MRO solutions ...

- Different market footprints
- Different digital capabilities and Functionality





## ... and a lot of options to 'bolt on' ...

- Paperless Manuals and Tech Pubs
- Electronic TechLogs (ETL/ELB)
- Paperless Task / Job Cards
- Electronic Technical Records
- Paperless Lease Returns
- Maintenance Planning
- Inventory Management
- Mobile Apps
- Lots more bespoke solutions



### LATEST DEVELOPMENTS

## ... and a new promises of 'transformation'

- Blockchain
- Digital Twins
- Predictive Maintenance
- Big Data Analytics
- Artificial Intelligence
- Augmented Reality
- Maintenance Drones
- Voice Recognition
- Internet of Things
- Robotics
- RFID



dustry Standards

an ATA perspective



American Airlines addresses repetitive faults with data



Alaska Airlines takes control of inventory



**IMPLICATIONS** 

## For OEMs & MRO providers, the question is whether digitisation is a product to sell or a tool to exploit

MARKET NEWS	MARCH 5, 2018 / 4:36 PM / 5 DAYS AGO	
Airbus seeks \$10 bln annual commercial services revenue by 2025		
Reuters Staff	1 MIN READ	⊮ f

"Airlines loathe paying substantial hourly fees for AHM services. Typical fees are \$1 per hour, sometimes more, when airlines are willing to pay. This means that if the service were purchased for every jetliner, the aggregate revenue would be just \$100 million." – Kevin Michaels





## As the aviation digital technology matures, the MRO landscape will continue to evolve

M&A

Where OEMs have previously focused their Services M&A efforts on R&O investments, focus is now on acquiring IT expertise

**Digital Partnerships** 

When M&A is not possible, more "giant partnerships" (BOEING-Microsoft) are to come

New Players / Competition Non aviation incumbents are disrupting the markets (e.g. Amazon in the cargo market)

#### IMPLICATIONS

## There are a number of key questions that will impact all parts of the airline including flight ops:

Where are the cost savings to pay for all these new systems,
data scientists and data storage? Component maintenance or inventory, people, delays and cancellations? Who benefits?

2. Are the basics in place to exploit data? Tech log joined up EFB? Shop report data being considered?

How are you going to join up all these different systems? Is there one IT Road Map or every department is doing their own thing?

How will the new competitive environment play out? Who is
best positioned to gain? Should you build it yourself, go with the 'agile' little guy or the 'safe' OEM?

Source: ICF

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# Thank You!

