NBAA|BACE
OCTOBER 16-18, 2018 · ORLANDO, FL

Big Data and Analytics – Creating Actionable Intelligence

Wednesday October 17, 2018 - 3:30 pm - 4:30 pm

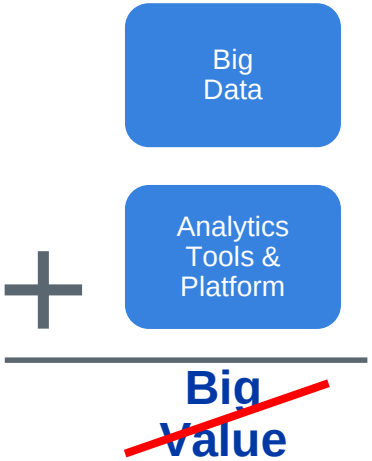
Shane Benfield – Boeing Global Services Analytics

Key Themes for this session

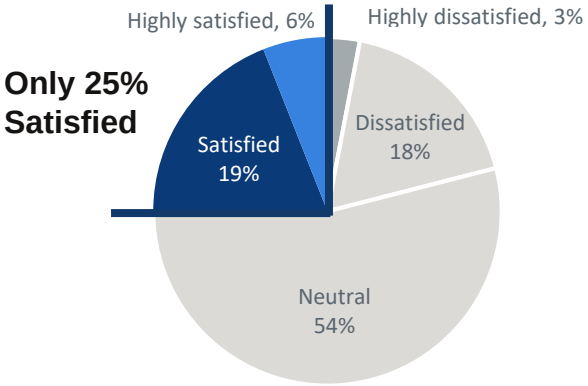
- Focus on outcomes before data
- Collaboration is key
- Analytics programs are scalable

Analytics Projects

The Promise

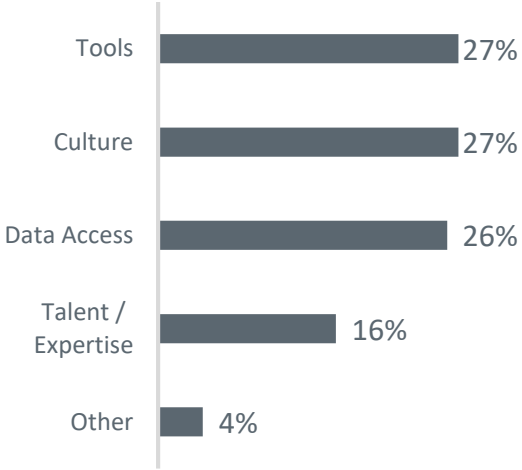


Today's Reality



How satisfied are you with results of current analytics projects?

Key Challenges

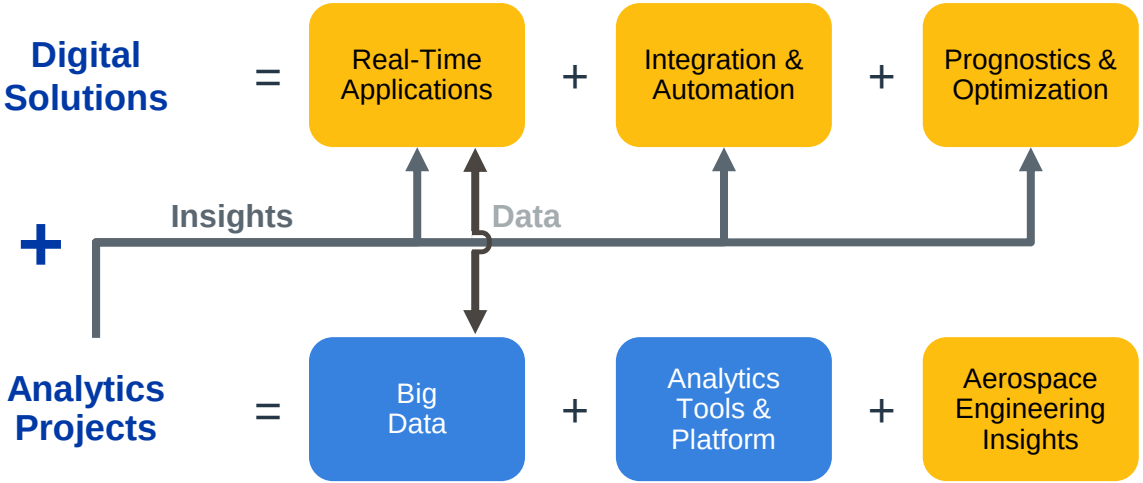


What are your key challenges to achieving improved results from analytics?

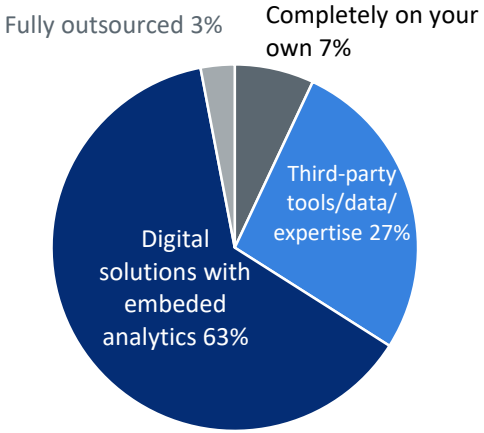
Source: Boeing Global Services Customer Conference (11/2017)

Our Perspective

Customer Value Through an Analytics Ecosystem



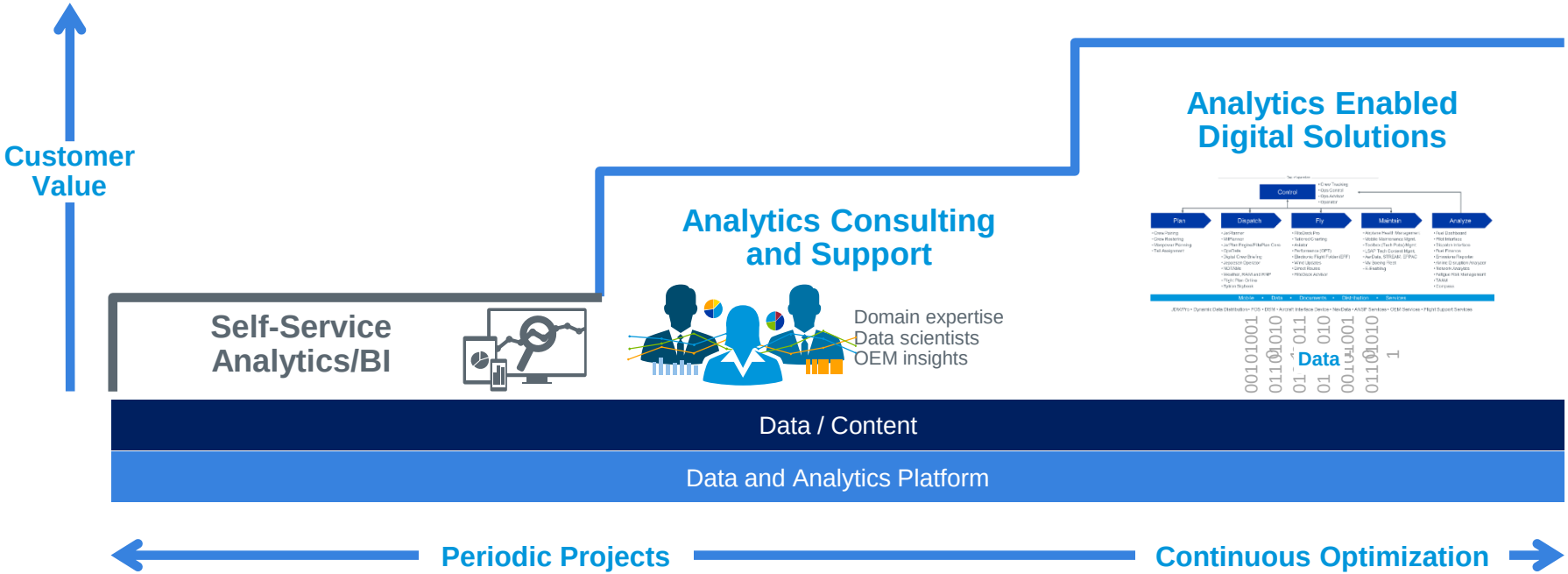
Provide Customer Choice



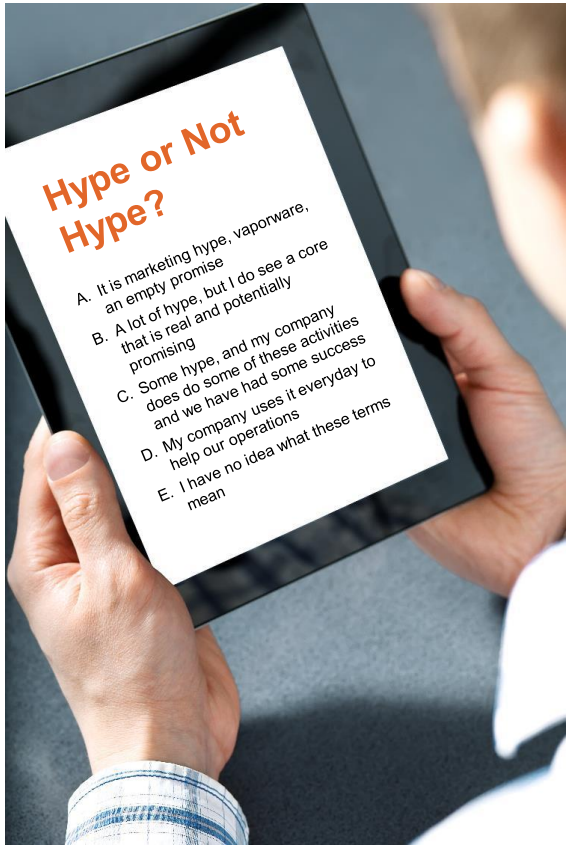
How do you plan to maximize the value of analytics?

Source: Boeing Global Services Customer Conference (11/2017)

End-to-End Analytics



Two Questions



Question 1: Hype – Not Hype?

Big Data, Data Mining, Data Analytics, Artificial Intelligence

A. It is marketing hype, vaporware, an empty promise

B. A lot of hype, but I do see a core that is real and potentially promising

C. Some hype, and my company does do some of these activities and we have had some success

D. My company uses it everyday to help our operations

E. I have no idea what these terms mean

Question 2: To what extent is your operation using data and data analytics?

A. We have our own in-house analytics team

B. We use outside consultants to handle our analytics needs

C. We use analytics enabled applications in our operations

D. We use consultants and analytics applications

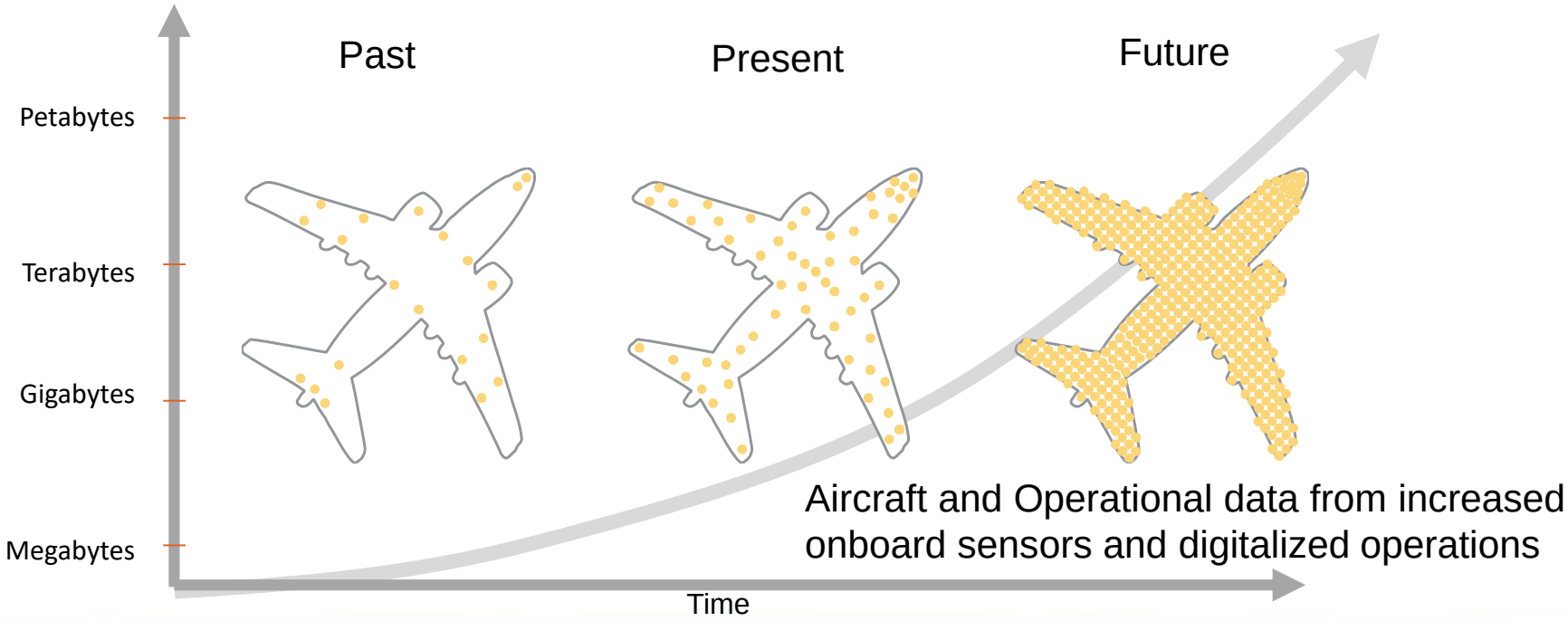
E. To my knowledge we don’t use any analytics

What does a BA operator care about?

- Safety
- Customer Service
- Demand
- Weather, ATC or other impacts to day-of-operation
- Operating Costs
- Maintenance Events
- Fuel Management
- Special Events

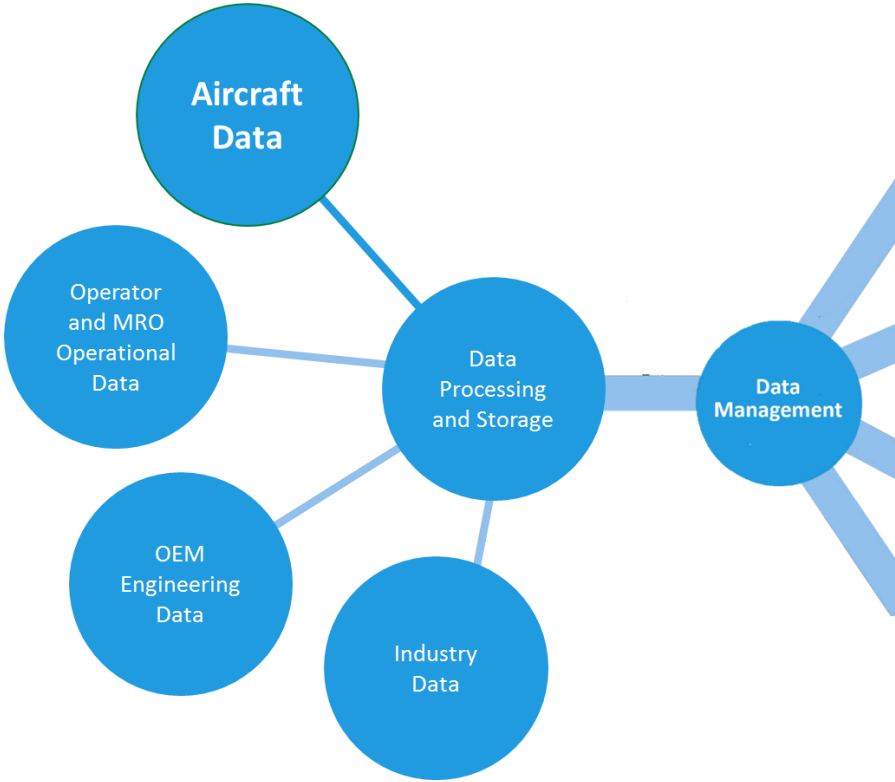
Aerospace data generation growing exponentially

Digital transformation of aerospace is driving the creation of real-time data growth



What do we mean by data?

- Direct data – sensors readings
- Derived data – calculated from sensors or other onboard information
- Operational data – all non-aircraft data from flight ops to maintenance
- OEM and Industry data - like ATC, weather, and information provided by the manufacturers and suppliers



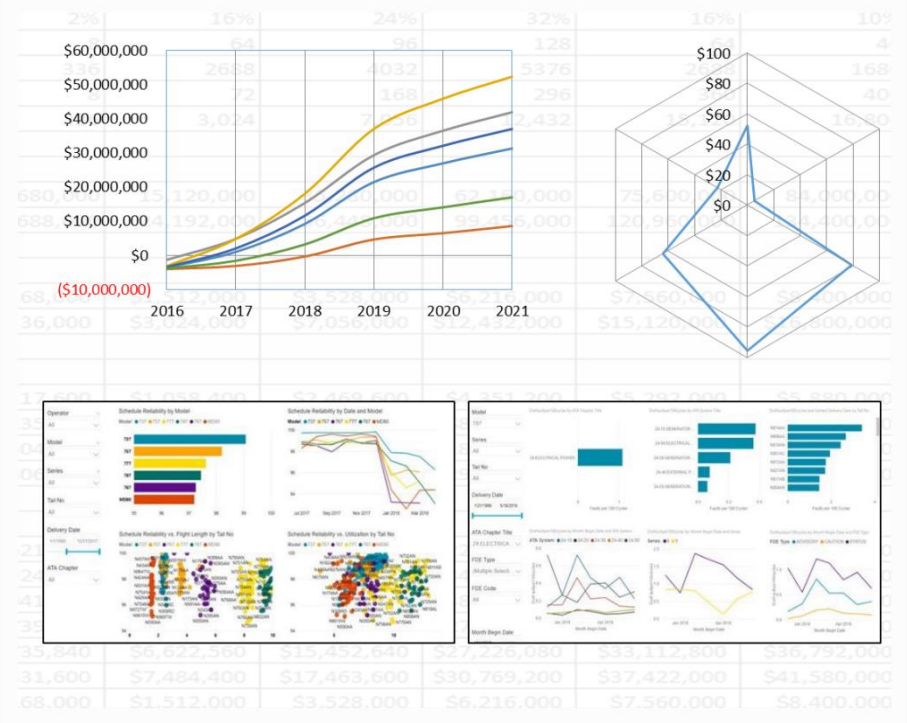
What is data analytics?

Transforming data into insights

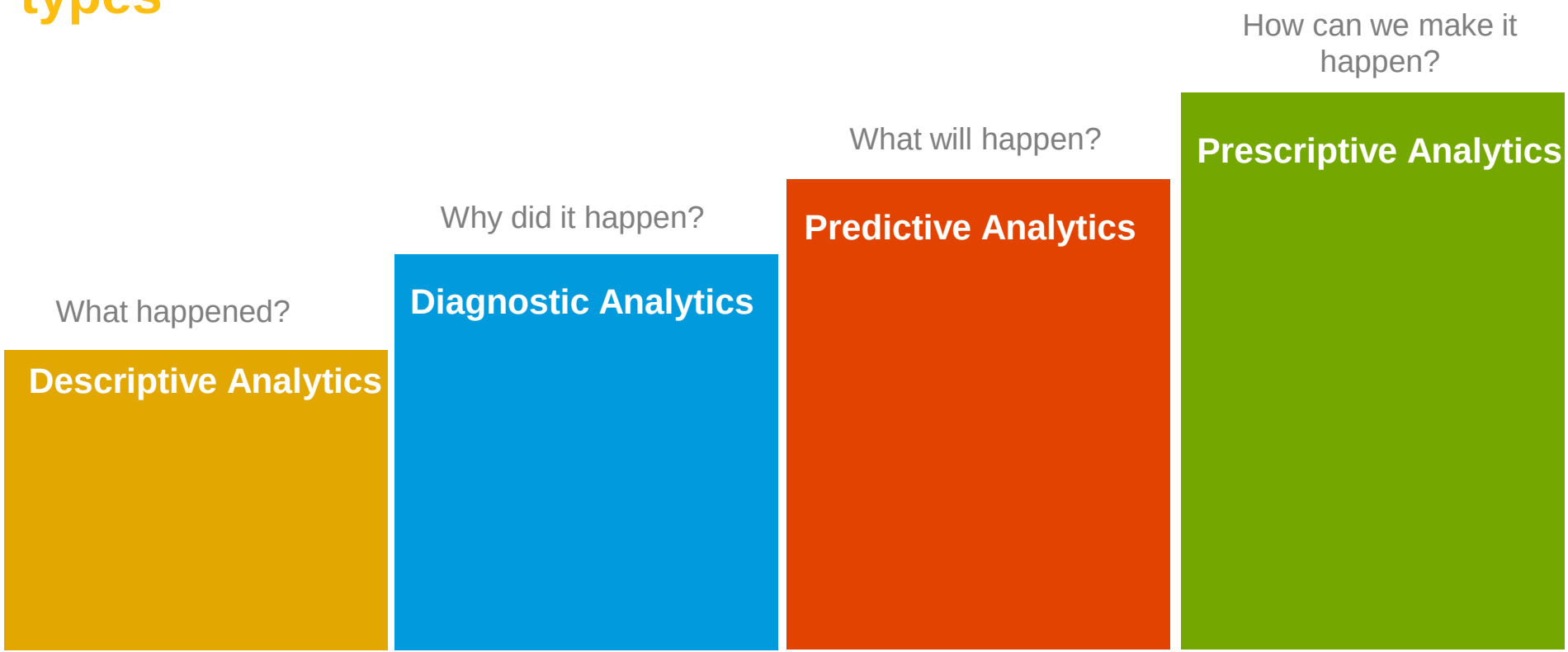
Used for revealing opportunities

Method to improve decision making

Tools to optimize processes



A brief overview of the four analytics types



It is more than statistics, it is a rich set of tools and methods

Examples:

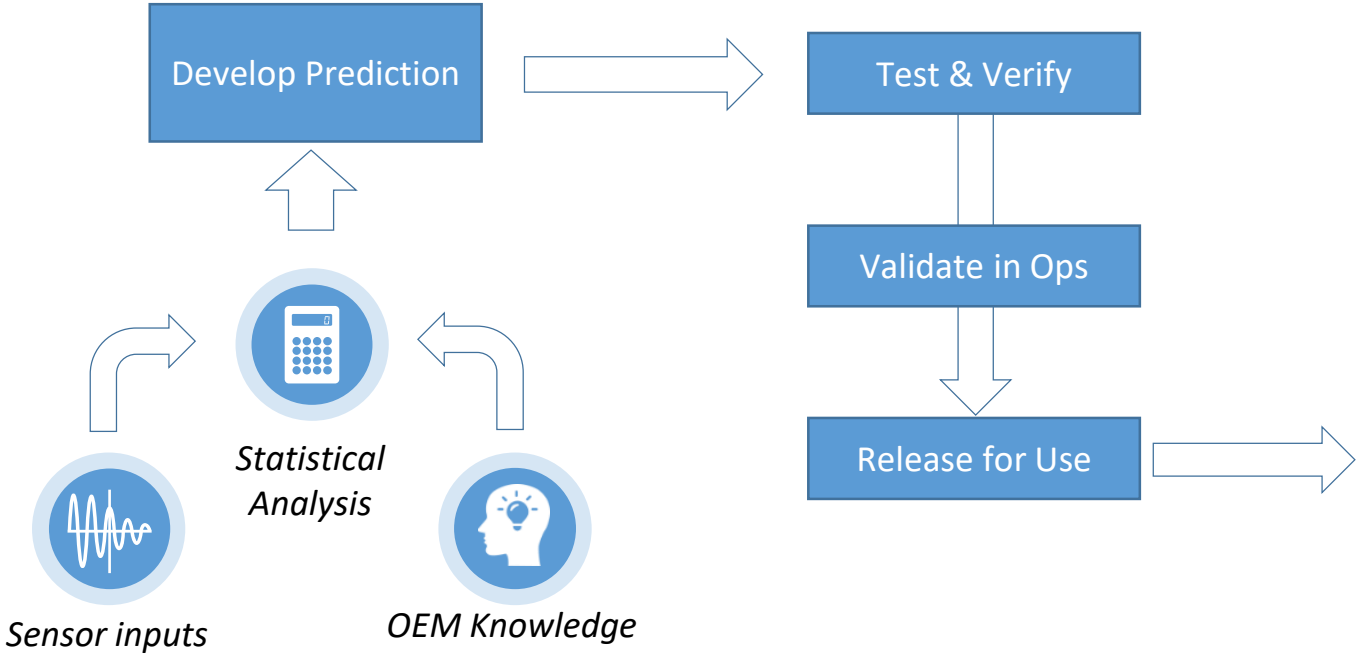
- Modeling & Simulation
- Machine Learning
- Text Analytics
- Data Visualization
- Statistics
- Network Analysis
- Non-Linear Optimization
- Pattern Recognition
- Expert Systems
- Artificial Intelligence
- Neural Networks
- Deep Learning
- Classification Engines
- Semantic Search
- Mathematics
- Indexing

In aviation technical operations, data and analytics represent physical objects and/or actions; real-world stuff.

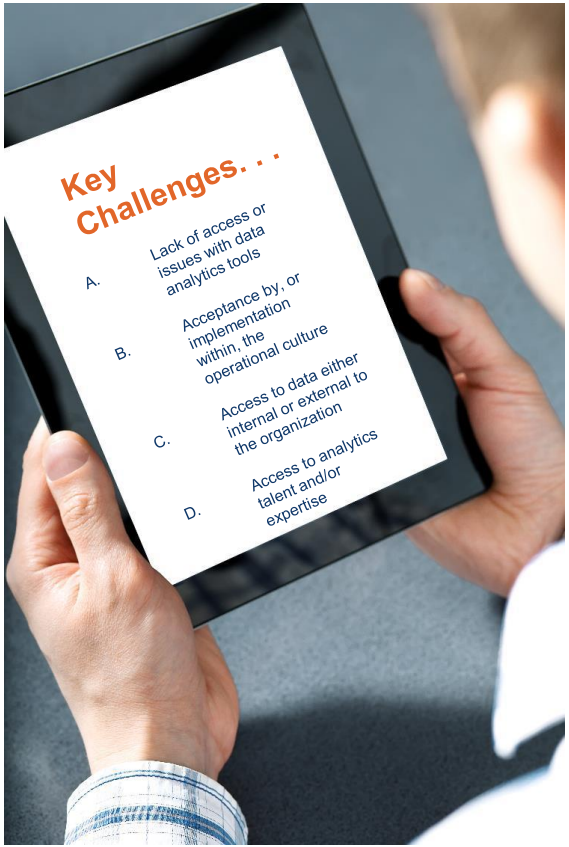
For example…

One method used to create a predictive alert

It takes historical data, data analytics, and domain expertise



Another Question



Question 3: What are your key challenges to achieving improved results from analytics?

A. Lack of access or issues with data analytics tools

B. Acceptance by, or implementation within, the operational culture

C. Access to data either internal or external to the organization

D. Access to analytics talent and/or expertise

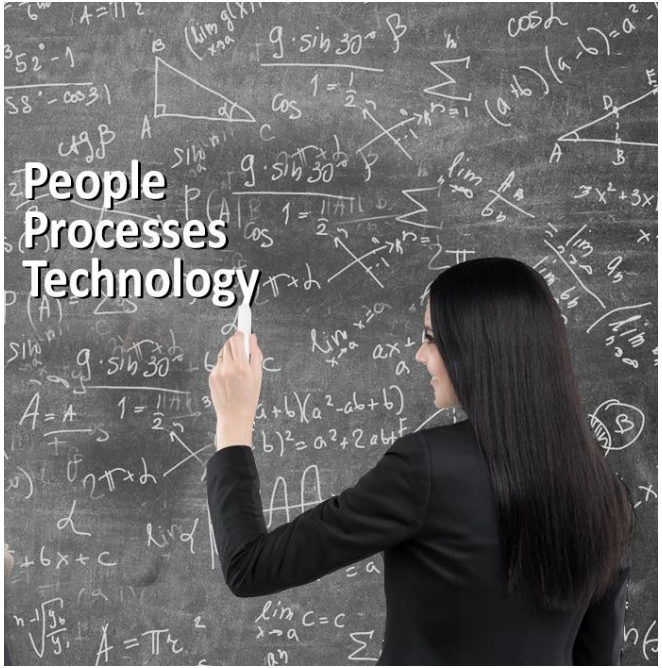
Approach to maximize value

Have clarity on business goals

Optimize the system

Identify the technology - applications

Prepare the people and processes



It all starts with goals

Understand the desired business outcome or goals before going after methods, technology, or data.

- Efficiency
- Performance
- Safety
- Economy
- Schedule
- Reliability

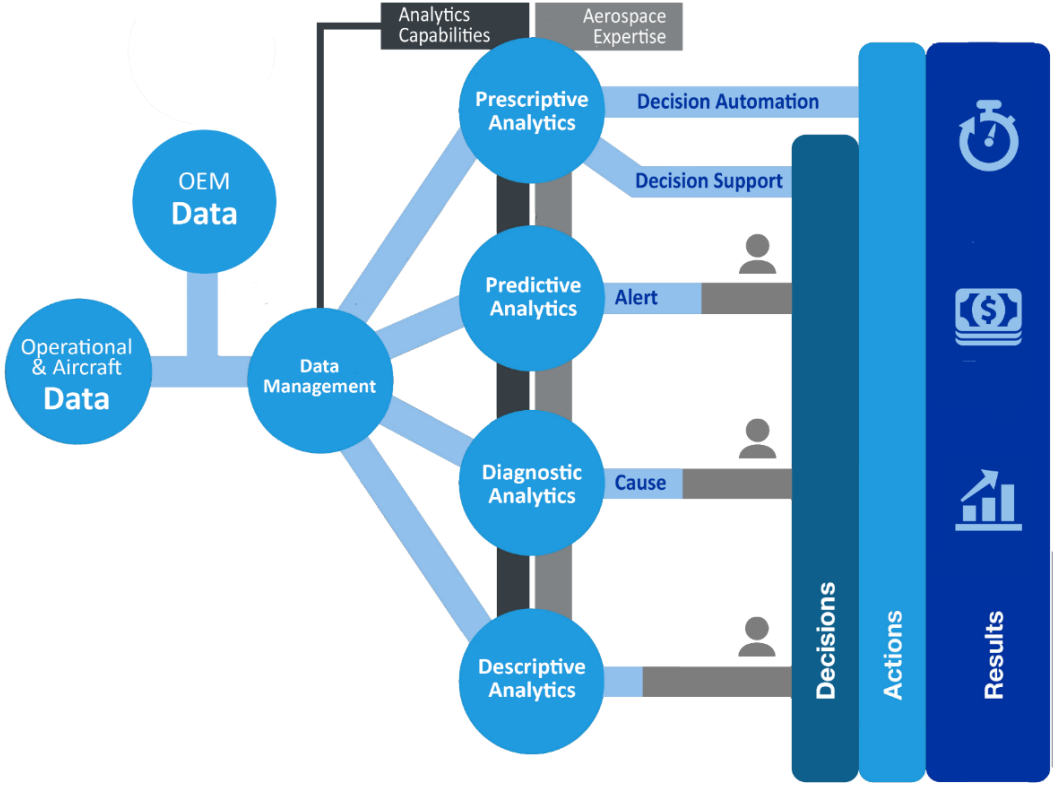
Results

Then we work back from the desired results with goals

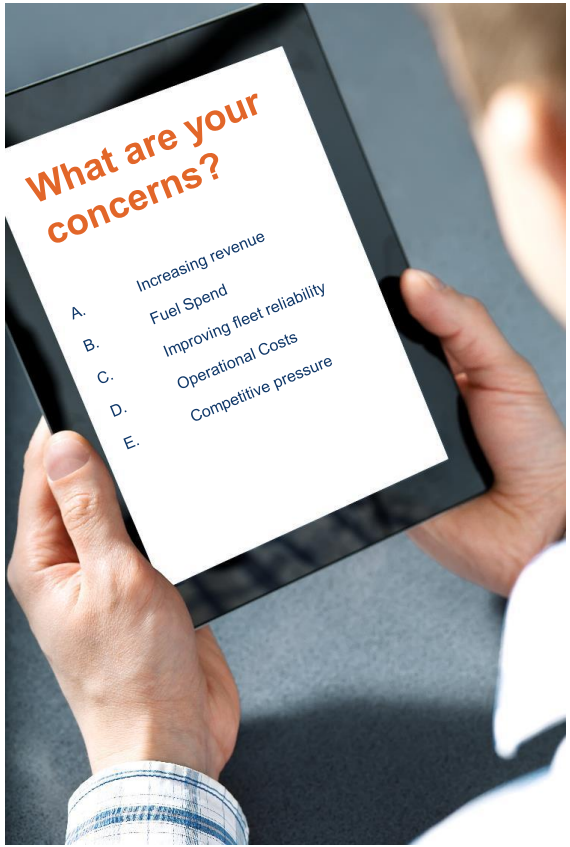
- What actions will be needed?
- What decisions drive these actions?
- What situations require these decisions?

This drives the right mix of analytics and data

This method also supports addressing the people and process issues at a system level



Last Question



Question 4: Of the issues listed below, which one are you most concerned about?

A. Increasing Revenue

B. Fuel Spend

C. Improving Fleet Reliability

D. Operational Costs

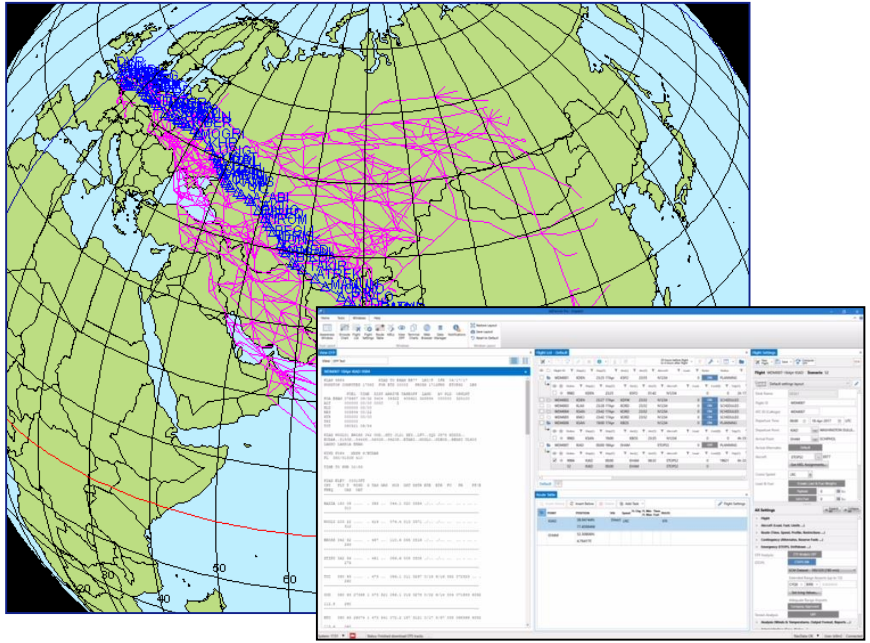
E. Competitive Pressure

Example Use Cases

Analytics applied to Flight Optimization

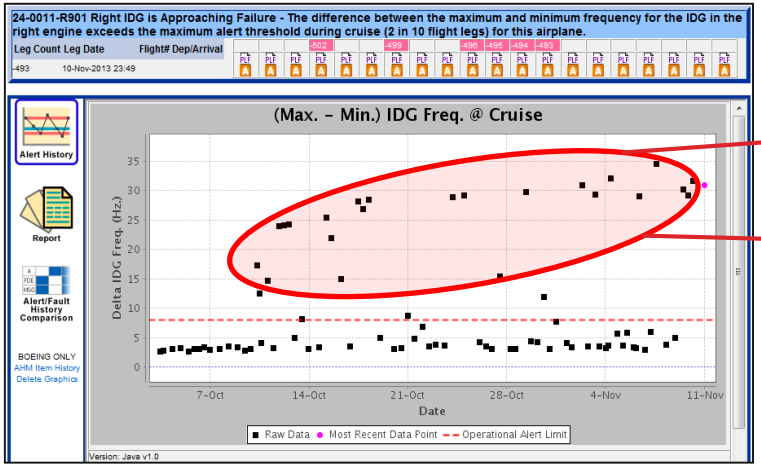
One major saved 350 min/day on 4K flights and reduced fuel by 14M lbs./year

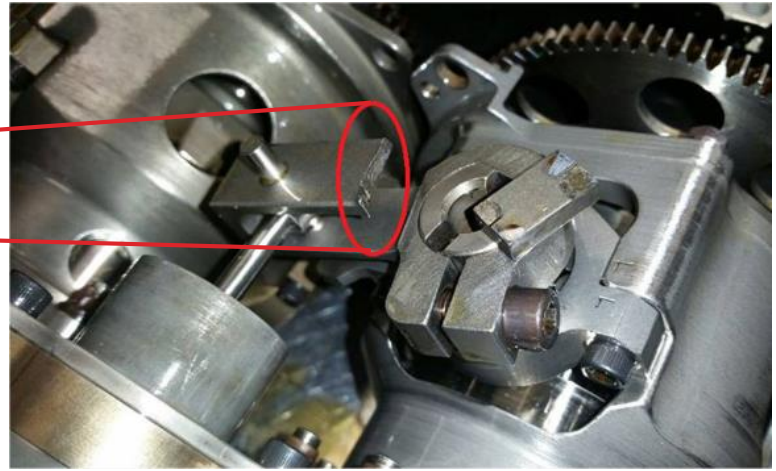
- Alerting on opportunities for optimization not available in a filed flight plan
- Continuously looking for post-departure wind-optimal shortcuts (10%- 20%)
- Monitors surrounding traffic, up-to-date weather, and airspace constraints



Predictive Maintenance

Eliminating unscheduled maintenance events – reduces delays or cancellations





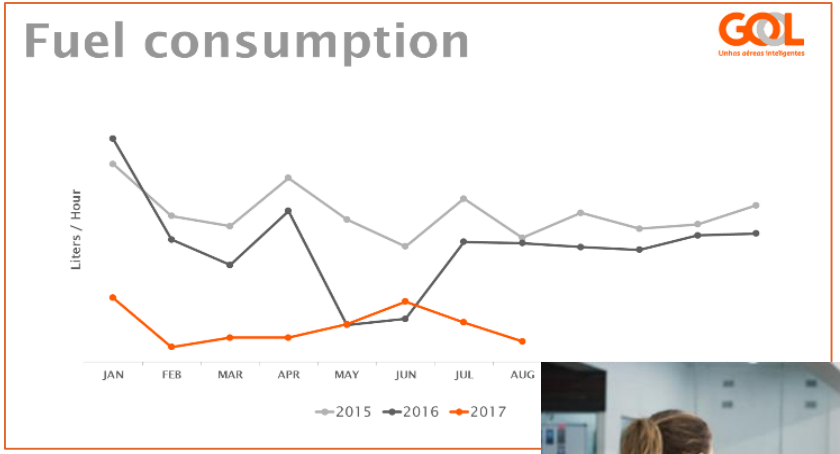
Predictive alert on 777 Integrated Drive Generator avoided an in-service delay or cancellation and saved up to $300,000 in repair costs.

Fuel analysis saves GOL 20 million kilos of fuel

Fuel savings of 1% - 3% have been achieved for some operators

GOL Transportes Aereos using fuel data analytics

- Identify potential savings and track savings across all phases of flight
- Benchmark performance and optimize flight plans



C-17 Lifecycle Optimization Program

New analytics applications to increase value and readiness

In-flight and historical data combined with maintenance plans and other data helped increase readiness and lower lifecycle costs

- Fleet performance trending and analysis
- Fuel optimization
- Part failure prevention
- Improved maintenance operations

Key Learnings

Data Analytics boosts competitiveness

- Focus on achieving a business outcome
- Data + statistics + tools + **domain expertise** = effective analytics solutions
- Analytics programs are scalable

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