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AVIATION

DATA & DIGITAL

WEBINAR SERIES

**DATA &
DIGITAL
CAPABILITIES
DURING CRISIS**



EPISODE 4 (BUILD RESILIENCE)

 **LIVE** WEBINAR WILL START SHORTLY ...



Wednesday 20 May 2020

15:30 – 17:30 CEST

#StayStrong #WeAreAviation #StrongerTogether



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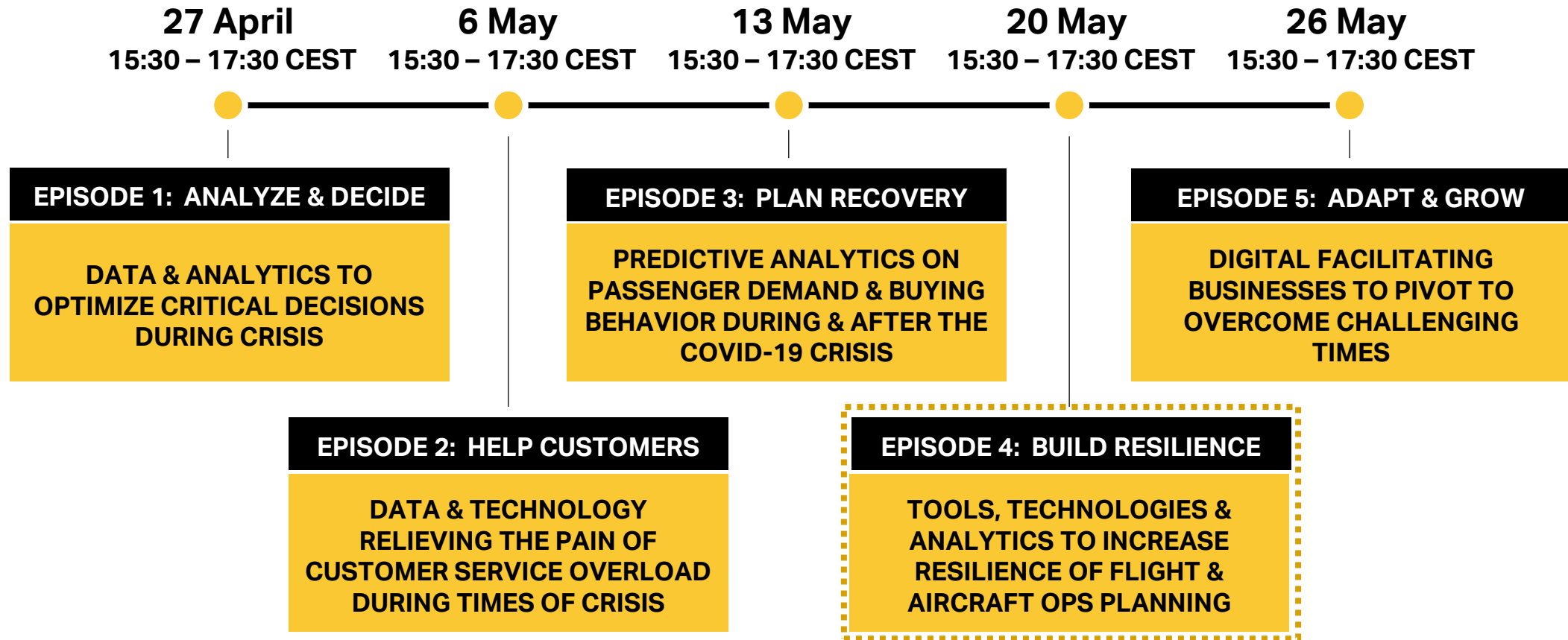
EPISODE 4 (BUILD RESILIENCE)



● **LIVE** PRESENTATION IN PROGRESS

Hومان Goudarzi
Head of Business Intelligence & Industry Engagement, IATA

Aviation Data & Digital Webinar Series



For more information & Registration go to:

iata.org/addws

▶ AVIATION DATA & DIGITAL WEBINAR SERIES **EPISODE 4 SPEAKERS**



Diane Krisciunas

VP Product Management, GE Aviation



Duane Wehking

VP, Digital Solutions & Analytics, Boeing
Global Services



Fabrício La Banca

Senior Director Corporate Purchasing,
Lufthansa Technik AG



Houman Goudarzi

Head of BI & Industry Engagement, IATA



Jesus Rubio

Director Data & Digital Content, IATA



Martin Mitev

Captain & A-SVP, Flight Ops, airBaltic



Mohan Perumal

SVP, Operational Excellence & IT, Delta
Material Services (DMS)



Sander Stomph

VP Operations Decision Support, KLM



Simon Brown

Head of IT Architecture, Ops, Heathrow



Stuart Fox

Director Flight Operations, IATA

► TOOLS, TECH & ANALYTICS TO INCREASE RESILIENCE OF FLIGHT & AIRCRAFT OPS



Webinar Synopsis: Considering that short disruptions and high impact and duration crises are bound to occur from time to time. What is the potential of digital to ease the pain and make airlines and wider aviation more adaptable and resilient.

Moderator: Houman Goudarzi, Head of BI & Industry Engagement, IATA



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Stuart Fox

Director Flight Operations, IATA

15:40 – 15:55

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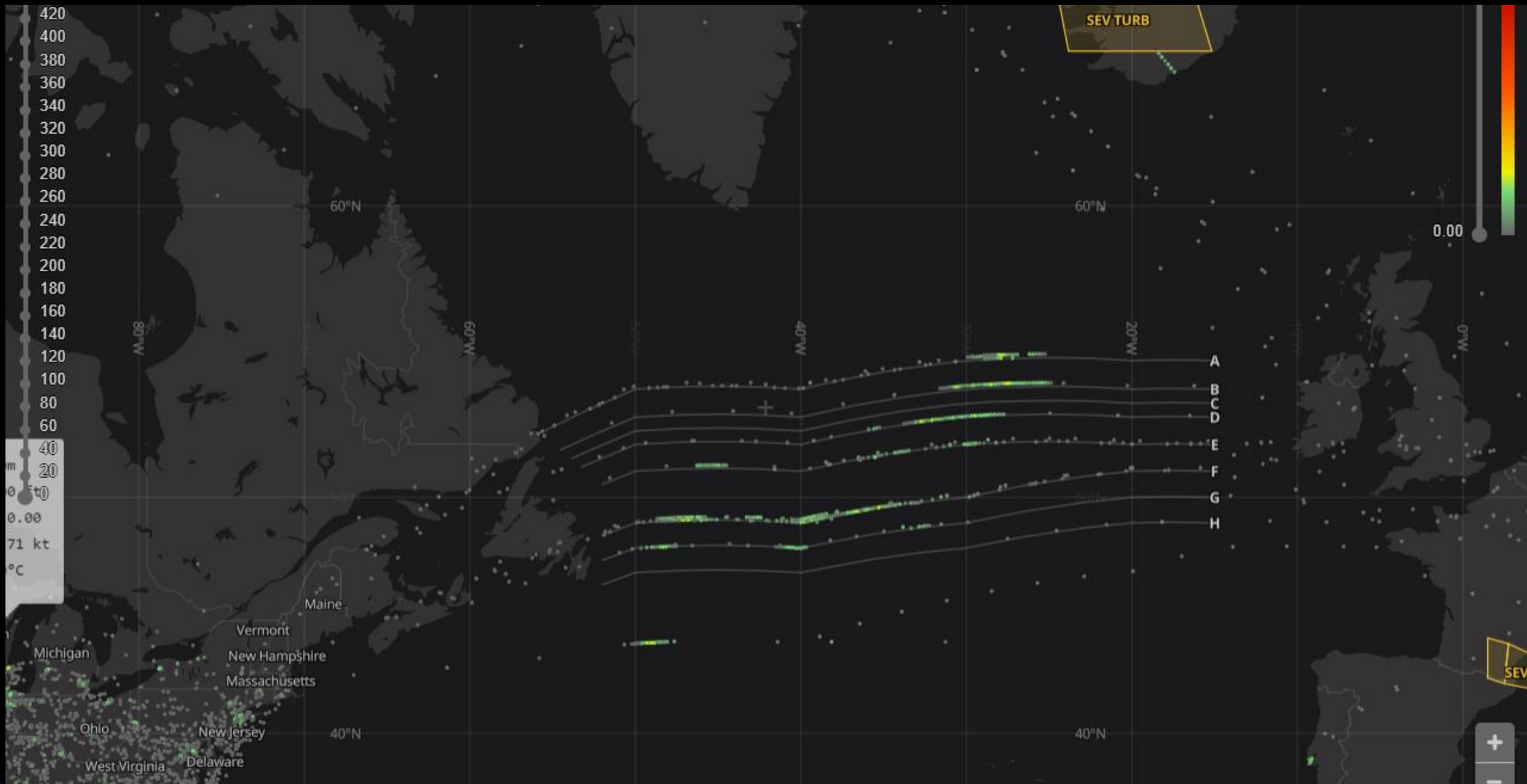
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airBaltic

Imagine where you can fly



Key Takeaways from COVID-19 Crisis, to Significantly Increase Resilience of Flight and Aircraft Operations

Martin Mitev

Airbus 220 Captain, Assistant to SVP Flight Operations

Definitions

- Resilience:
“the capacity to respond to a perturbation or disturbance by resisting damage and recovering quickly.”
 - Implies self-sufficiency and autonomy.



(Source: Merriam-Webster)

- Resilience Management Manual:
Organisational guide for an adaptive risk approach.

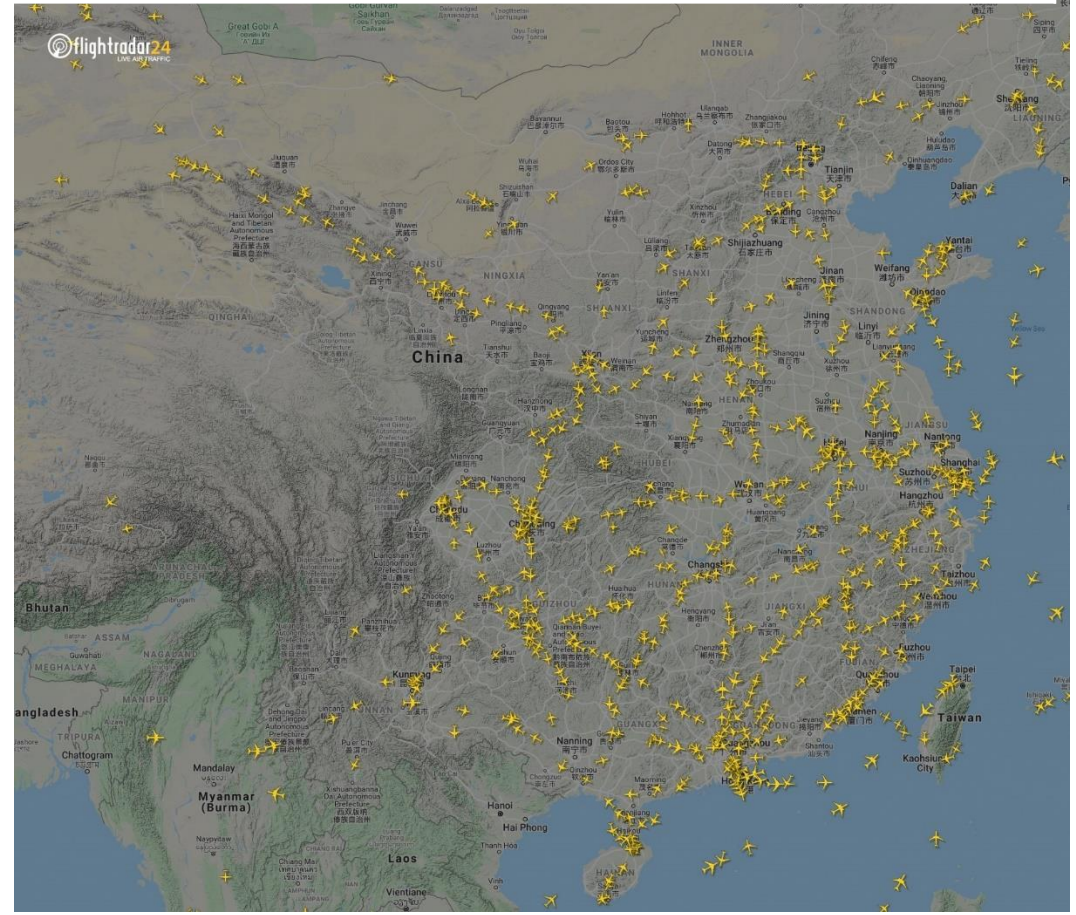


Key Takeaway 1: Know Your History

January



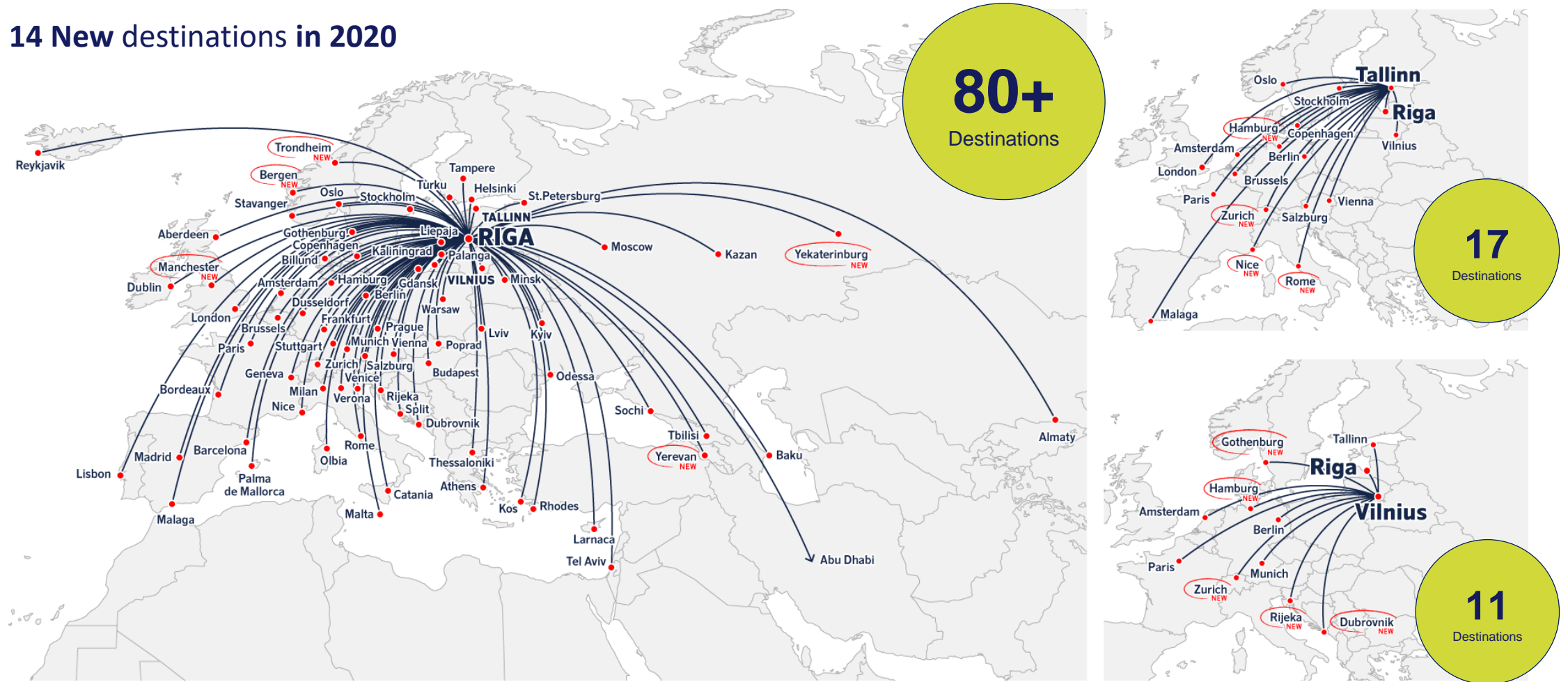
April



Direct Connectivity From airBaltic's 3 Hubs: Riga, Tallinn and Vilnius

Significant development of route network from 16 direct routes in 2002 to 100 routes in 2020 spanning Europe, Scandinavia, the CIS and the Middle East

14 New destinations in 2020



Departure (local time)	Route
11.05.2020, 07:10	Riga (RIX) - Baku (GYD)*
11.05.2020, 11:00	Riga (RIX) - Amsterdam (AMS)*
11.05.2020, 13:50	Baku (GYD) - Frankfurt (FRA)
11.05.2020, 13:50	Baku (GYD) - Riga (RIX) with a stopover in Frankfurt (FRA)
11.05.2020, 14:20	Amsterdam (AMS) - Riga (RIX)
11.05.2020, 19:05	Frankfurt (FRA) - Riga (RIX)
12.05.2020, 11:00	Riga (RIX) - Amsterdam (AMS)*
12.05.2020, 14:20	Amsterdam (AMS) - Riga (RIX)
14.05.2020, 11:50	Riga (RIX) - Frankfurt (FRA)*
14.05.2020, 15:10	Frankfurt (FRA) - Riga (RIX)

Key Takeaway 2: Know Your Destination



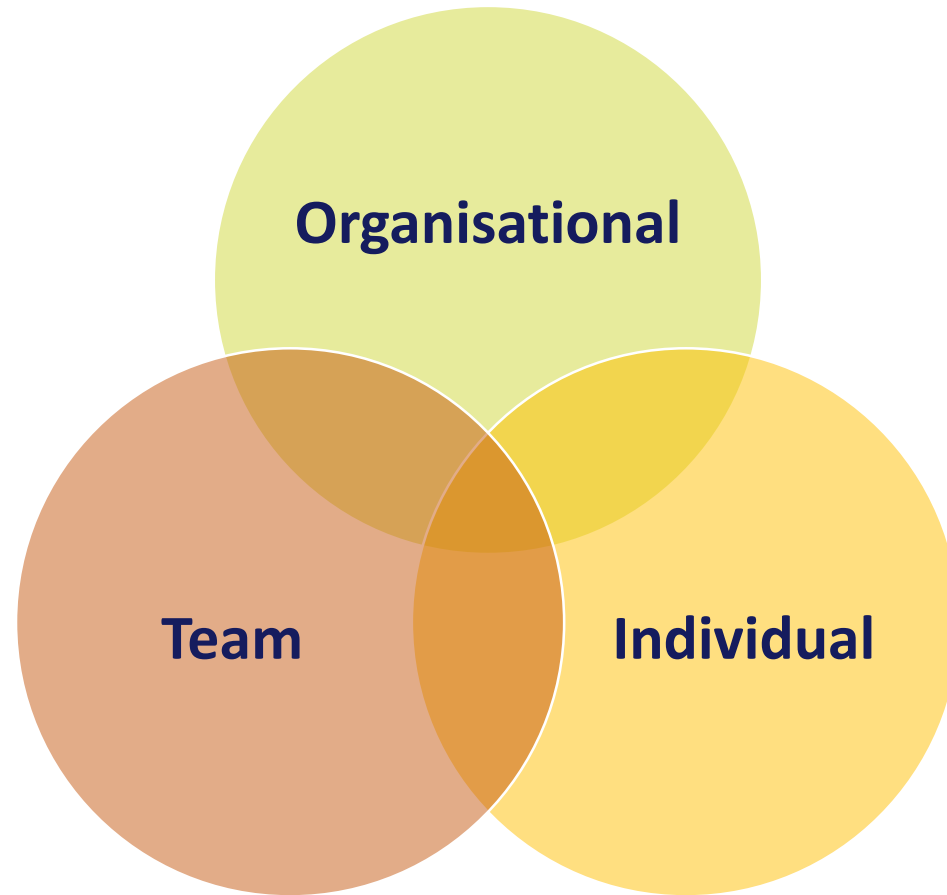
Key Takeaway 3:



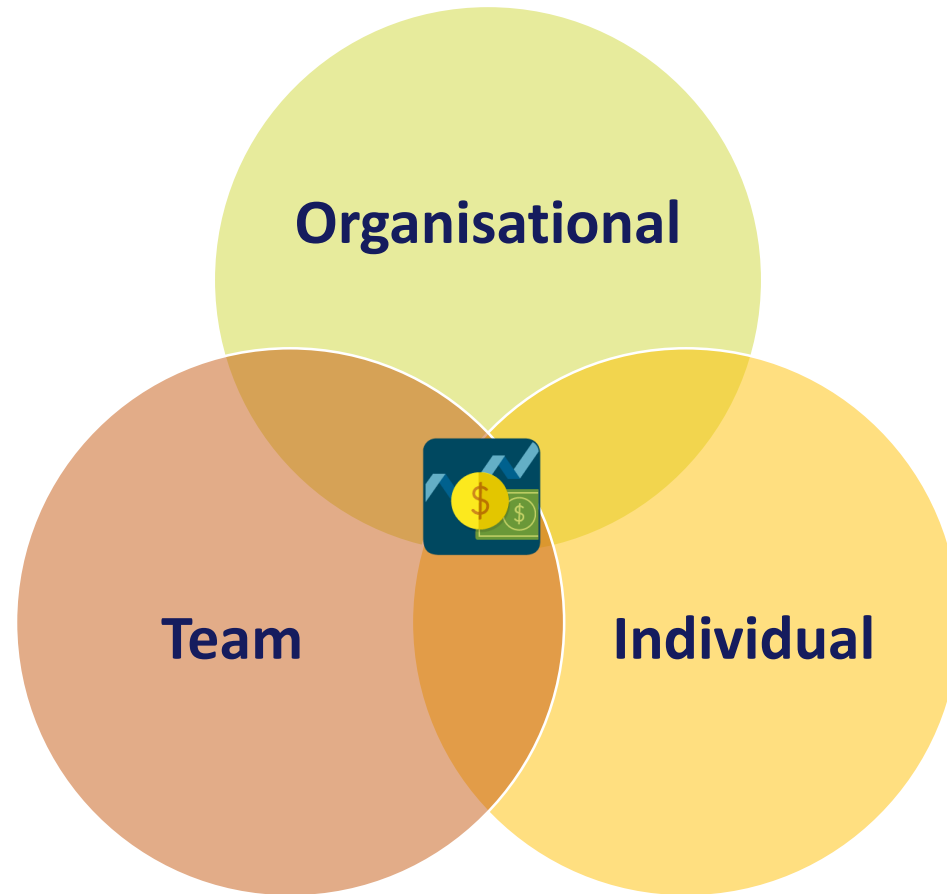
Key Takeaway 3: Know Your Cash



Multi-Layered View of Resilience



“No Money, No Fun”



Key Takeaway 4: Know Your Plan



STAY



REVISE



GROW

Key Takeaway 4: Know Your Plan

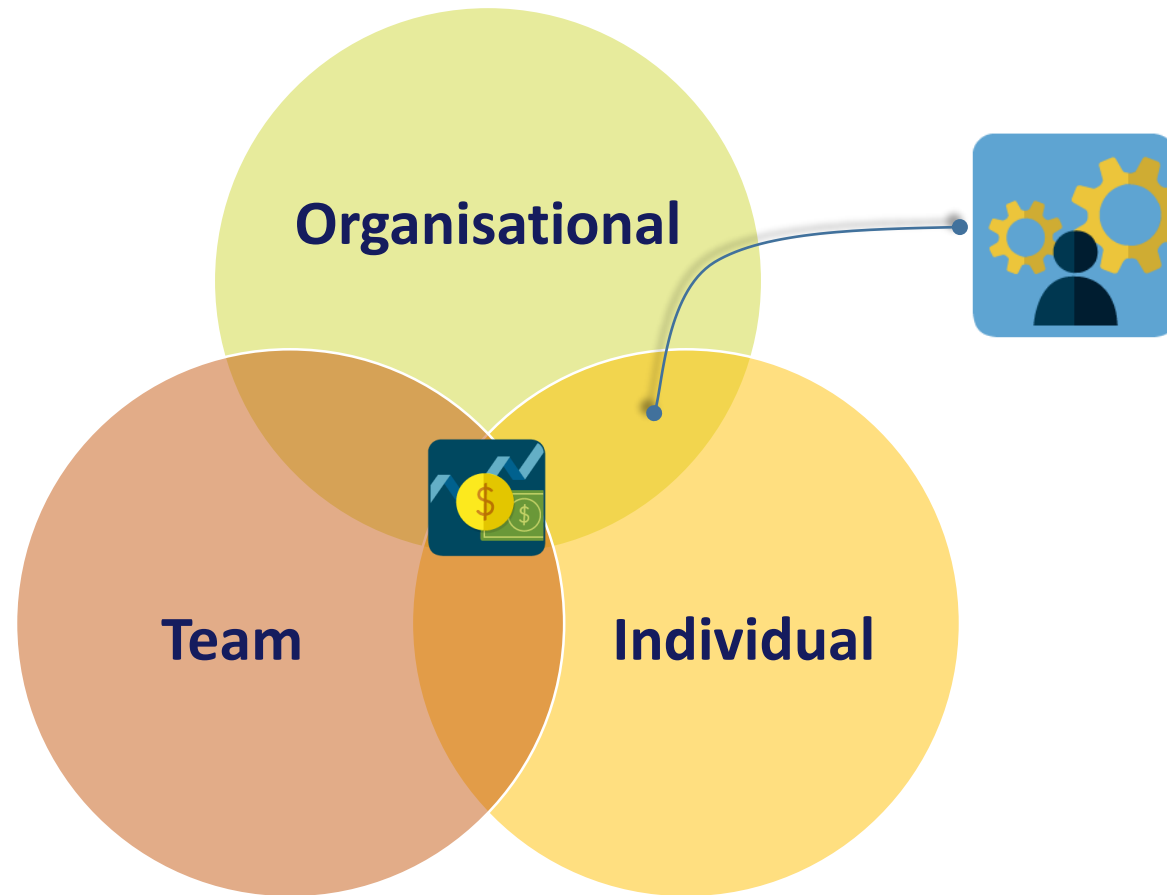


Resilience in Operations – the “As-You-Go” Theoretical Concept

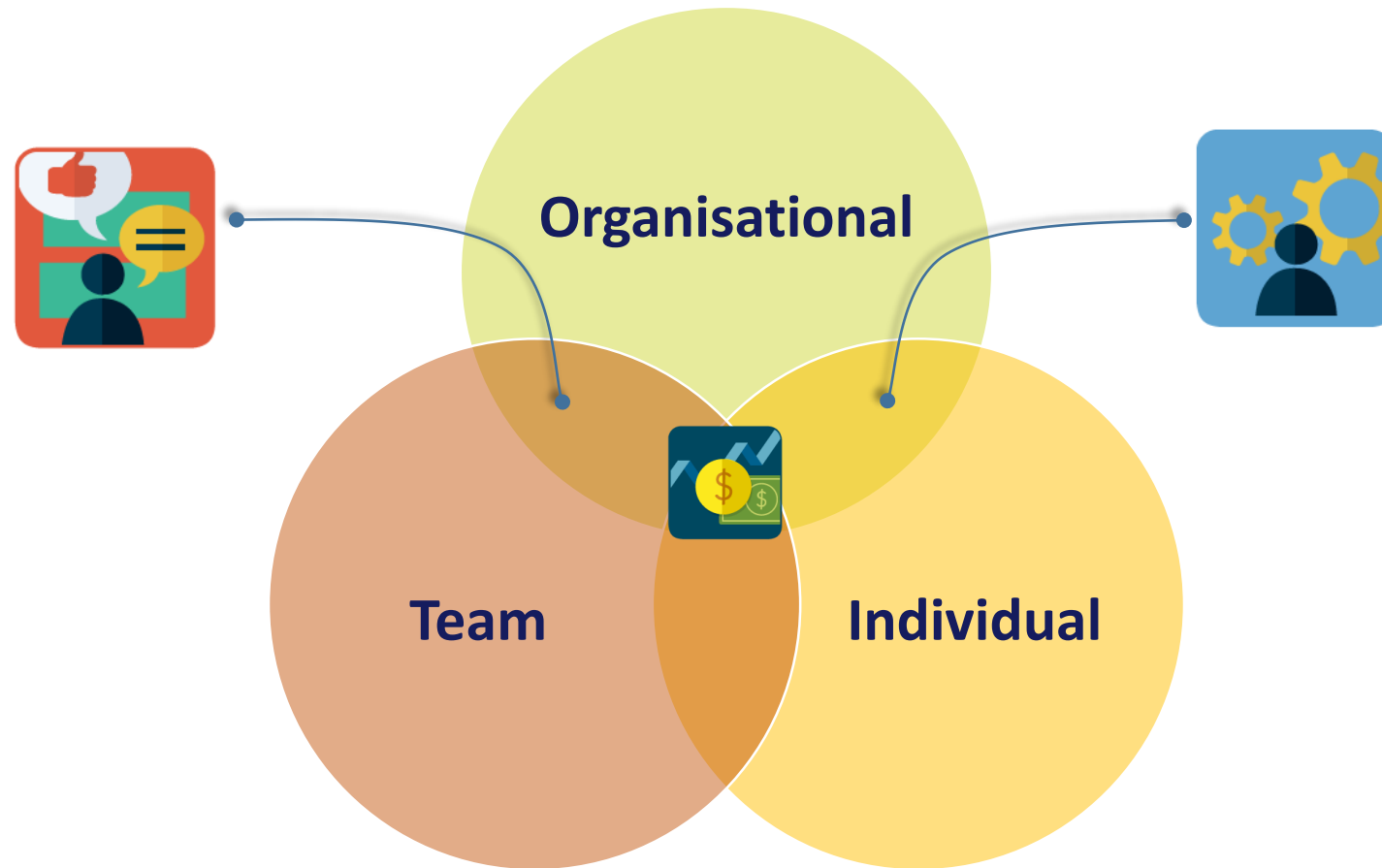


- Know
- Employ
- Move
- Pay

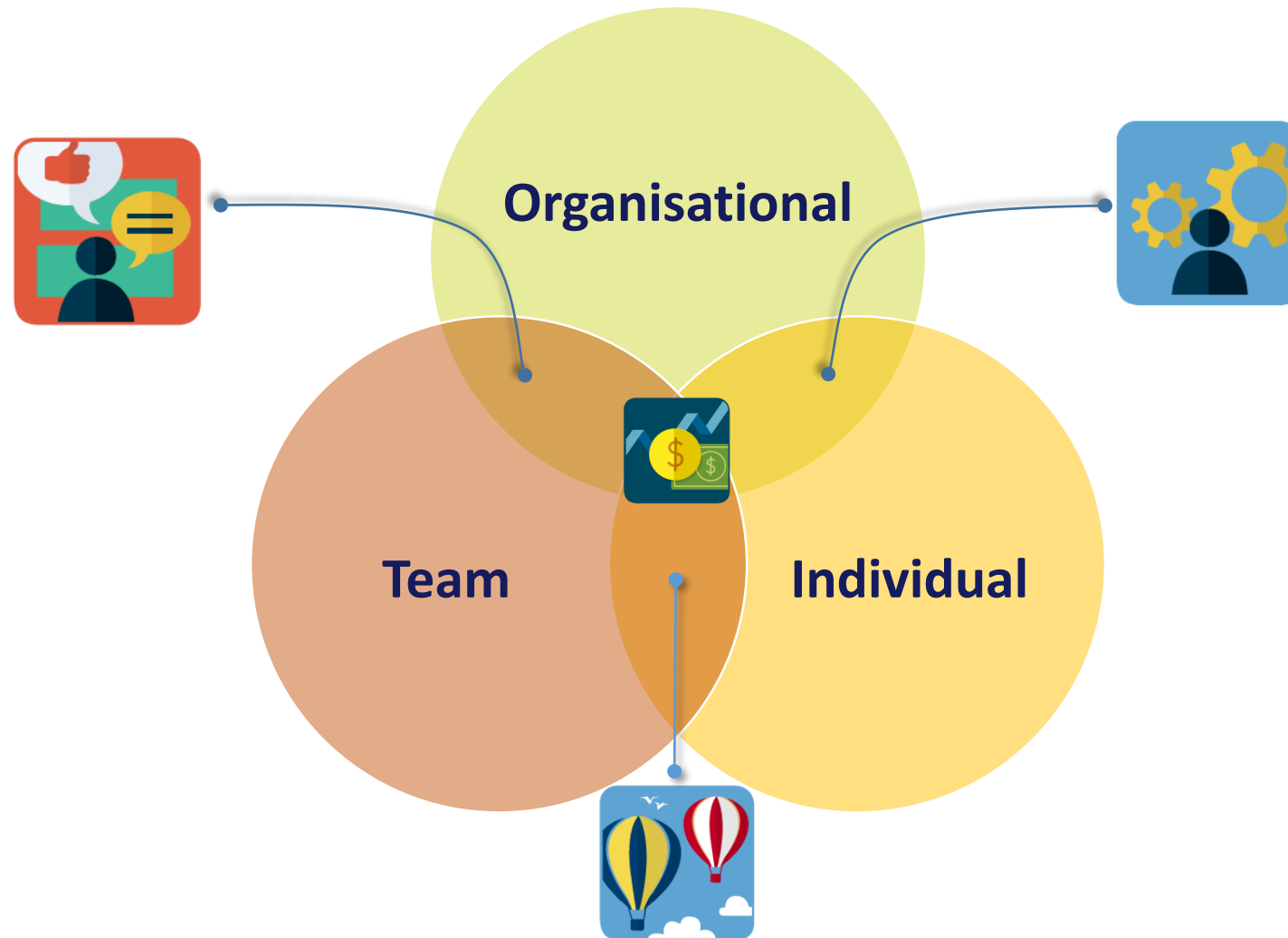
Key Takeaway 5: Know Your Tools – Skills



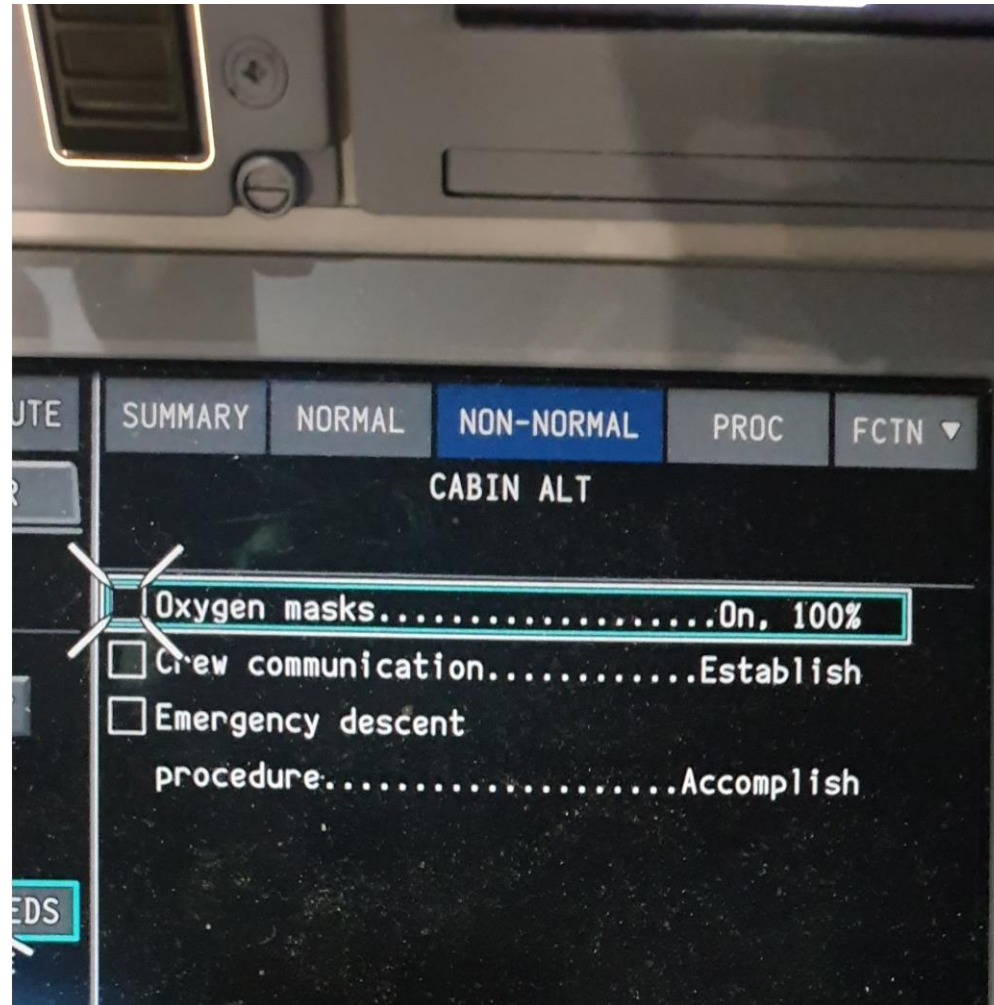
Key Takeaway 5: Know Your Tools – Talk



Key Takeaway 5: Know Your Tools – Train the Trainer



Key Takeaway 6: Create a Checklist



Key Takeaways - Summary

	Know your History.
	Know your Destination.
	Know your Cash.
	Know your Plan.
	Know your Tools.
	Act – Short-term.
	Deferred to After Takeoff Checklist: Act – Long-term.

Wise men say...

Never waste a good crisis.



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Transforming data resilience for the post-COVID-19 era



Simon Brown CEng MIET
Head of IT Architecture, Heathrow



COVID-19 impact



Re-charging our
business



Long-term
sustainability

80 million
passengers a year



82
airlines serving
204
destinations in
85
countries

76,000 jobs
supported at the airport



34%
of UK exports by value for non-EU
exports

2
full length
runways
and
4
operational
terminals



9
routes to other UK airports



COVID-19

200,000
Passengers in April



1,788
cargo-only flights
in April



Consolidation

1
full length runway
and

2
operational
terminals

Supporting the **NHS**

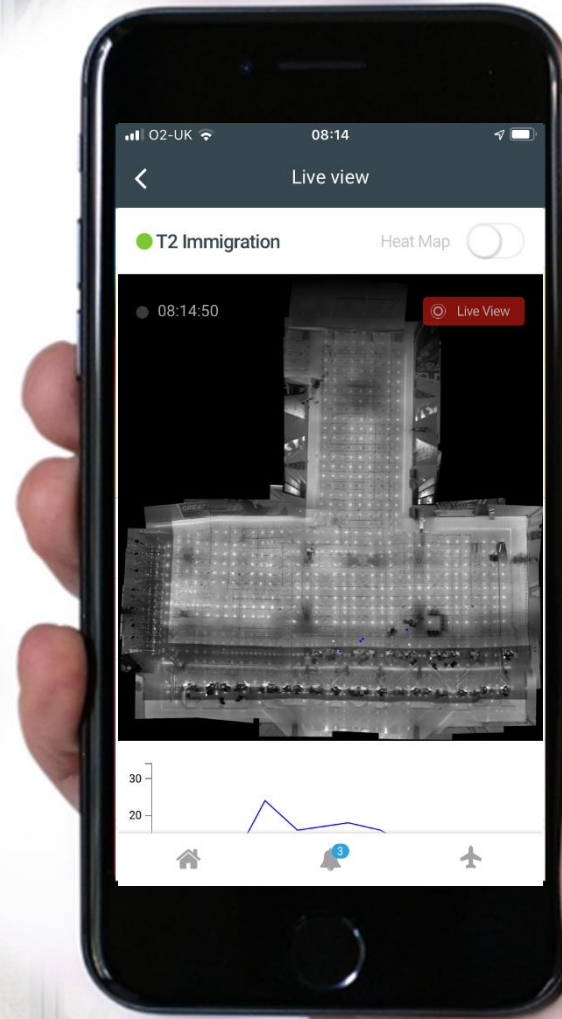


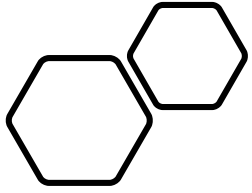




Digital & Data

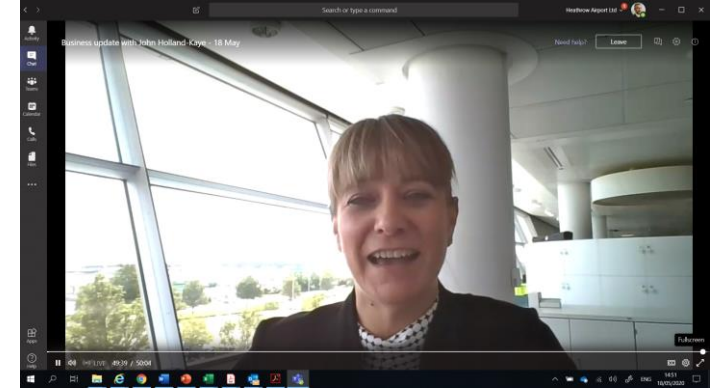
Supporting
our colleagues

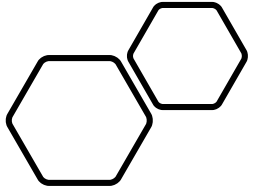




Digital Workplace

Supporting
our staff





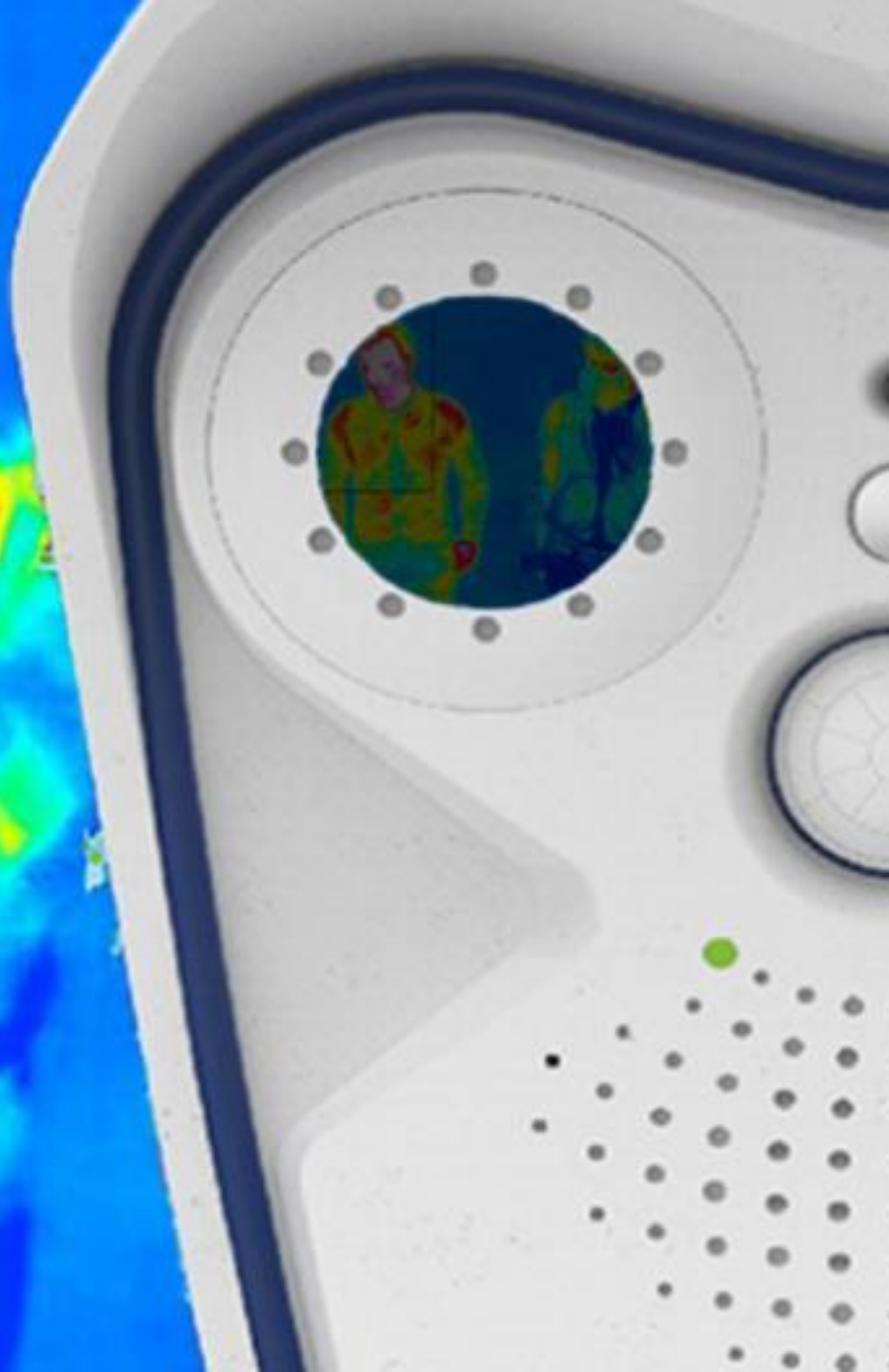
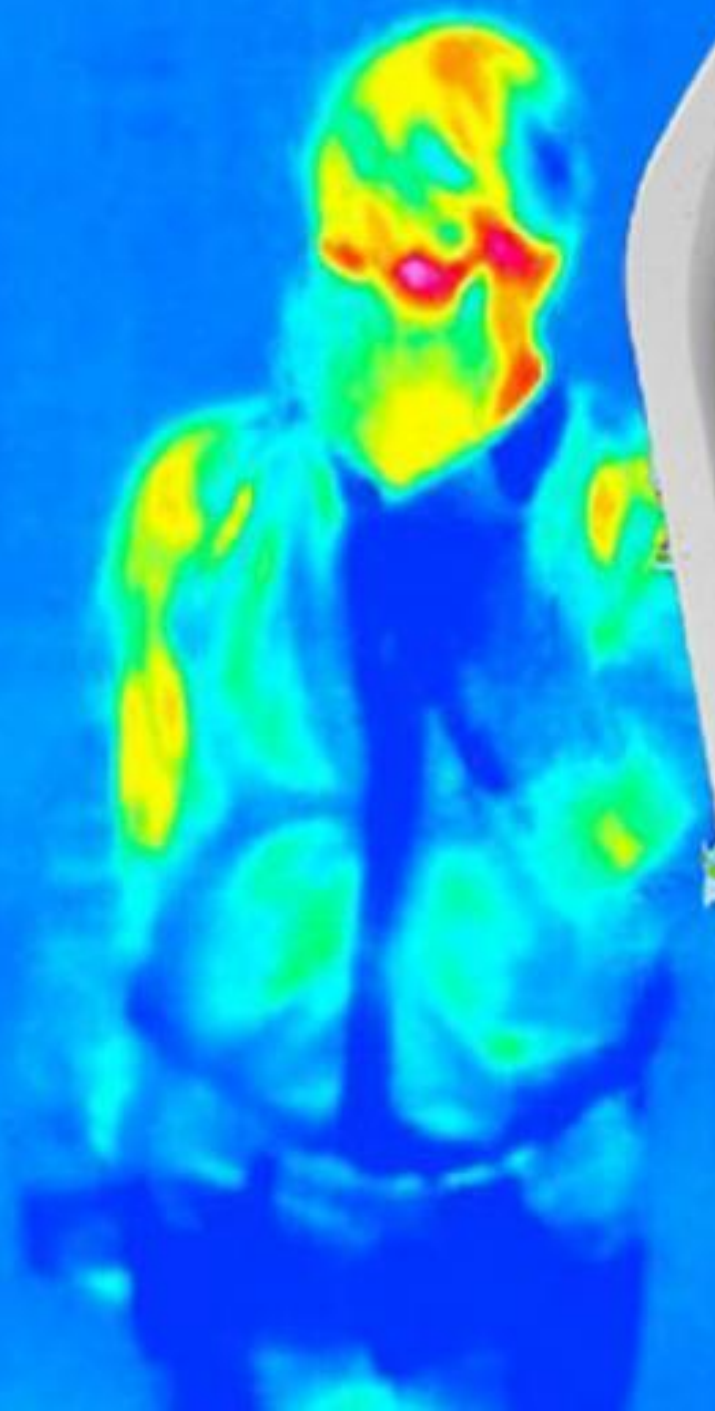
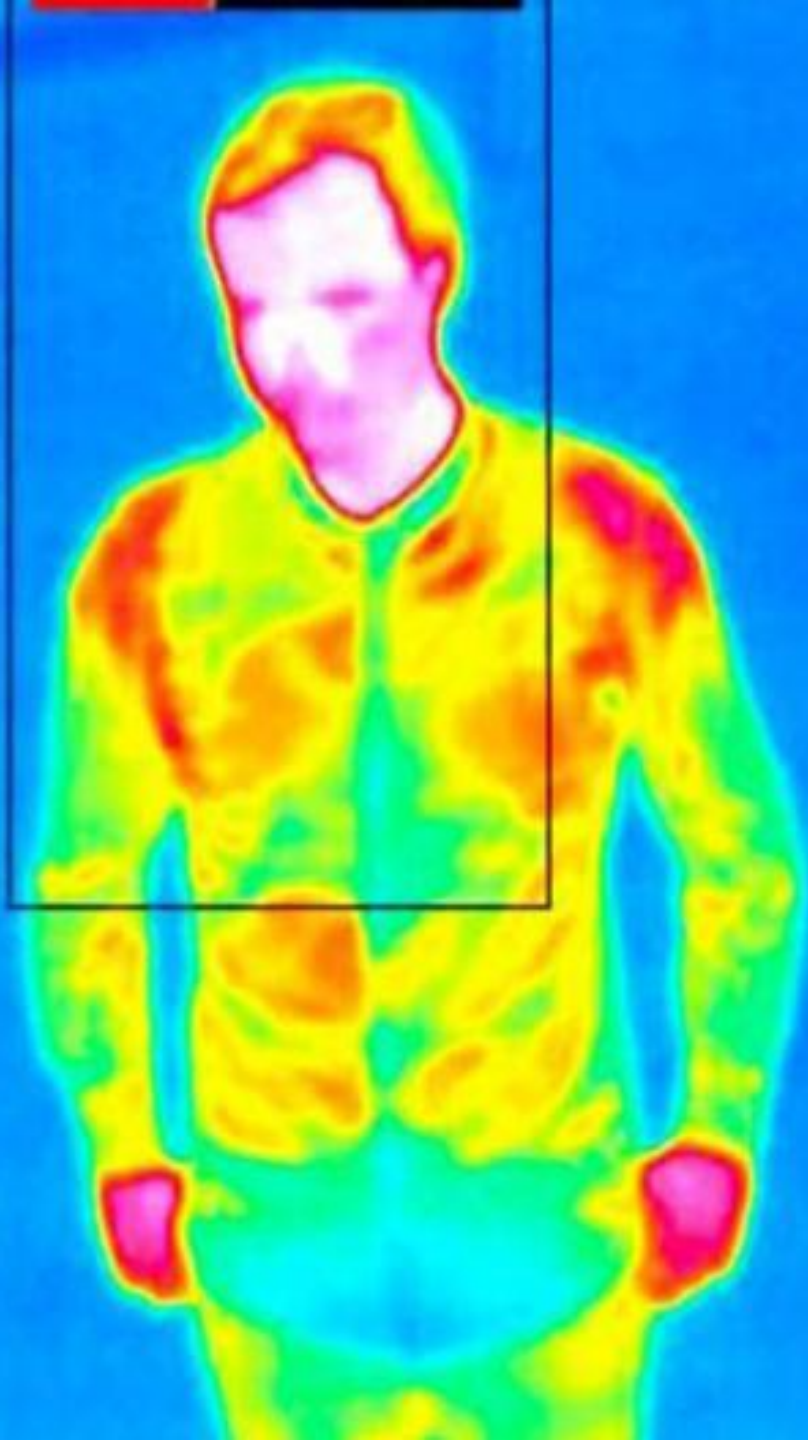
Digital
& Data

Supporting
our passengers





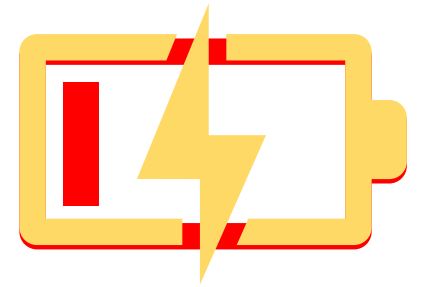
Re-charging confidence



“Aviation is the cornerstone of the UK economy, and to restart the economy, the Government needs to help restart aviation. [Agreeing a] standard is key to minimising transmission of Covid-19 across borders, and the technology we are trialling at Heathrow could be part of the solution.”

John Holland-Kaye - Heathrow CEO





Business
Traveller

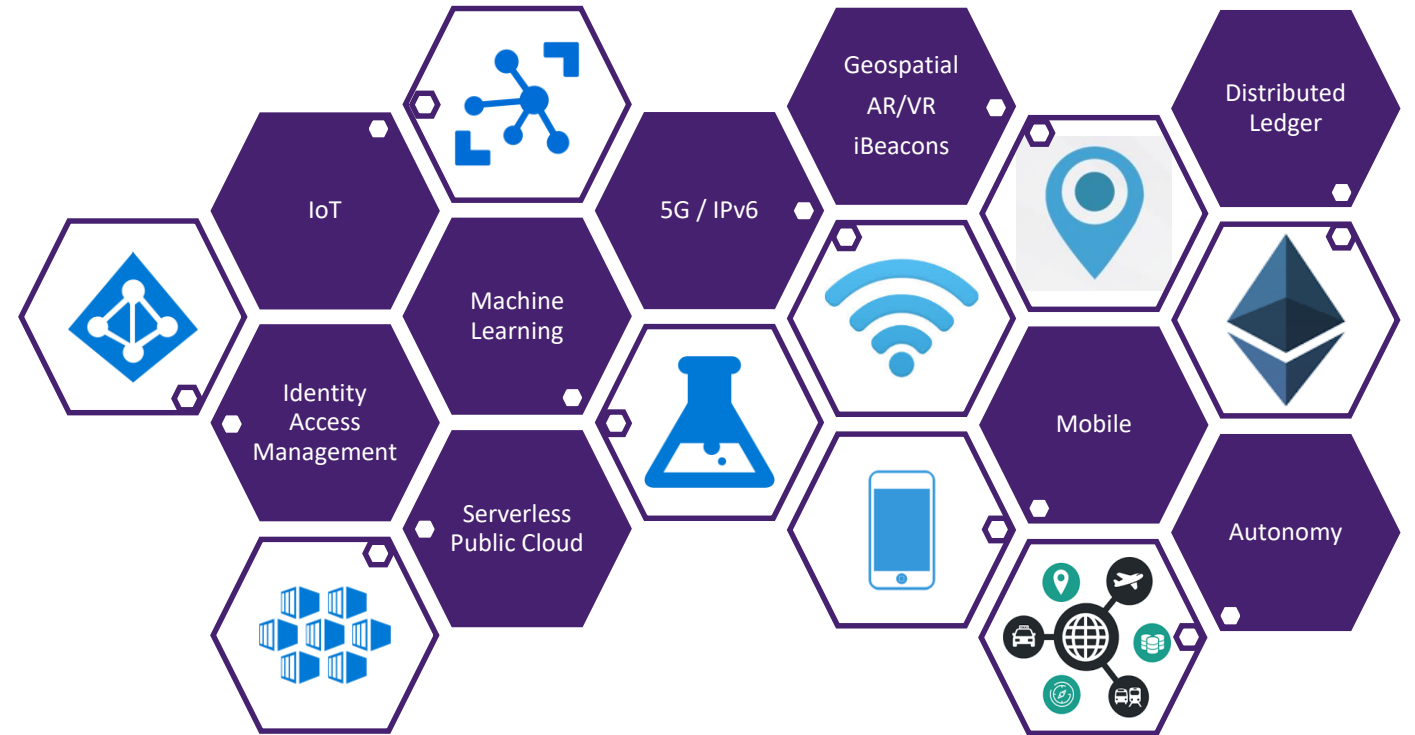
News

IATA: over two thirds of travellers will not fly if it means quarantine period

14 May 2020 by Mark Caswell



Innovations pipeline



Digital Disruption?

Data Centre ▶ Cloud

Amadeus booking software outages smack airports across world

Firm won't explain network failure

By Andrew Silver 28 Sep 2017 at 14:46

34 SHARE ▼



NEWS

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Heathrow Airport apologises for IT failure disruption

🕒 16 February 2020

Share

EUROCONTROL ✓
@eurocontrol

There has been a failure of the Enhanced Tactical Flow Management System. Contingency procedures are being put in place which will have the effect of reducing the capacity of the European network by approximately 10%. Further information will be provided as soon as possible.

📍 165 12:17 PM - Apr 3, 2018

311 people are talking about this

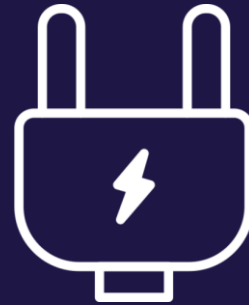




Will the
postcode do?

Please enter your Type B and
AFTN Station code for your
destination

The UK's Future Flight competition is to develop & demonstrate integrated aviation systems enabling the introduction of new classes of electric & / or autonomous air vehicles



These could include drones, urban air mobility (UAM) vehicles or electric regional aircraft



Air Traffic Management (ATM) & Unmanned Traffic Management (UTM) systems



Both physical & digital infrastructure to support future flight objectives



Autonomy



Digital & communications systems



New business models



Public acceptance



Transport integration



Vehicle technologies enabling integration to the new aviation systems



Simulation



Non-aerospace regulation



Viable, challenging, use cases



Total security systems

As we look to a future of increased trust, accountable governance, interdependence and resilience, our commitment to pioneering research remains despite COVID-19



Digital Readiness



Data-driven
international
collaboration



Data ecosystem
transformation

Thank you



[linkedin.com/in/uksimonbrown](https://www.linkedin.com/in/uksimonbrown)

Heathrow

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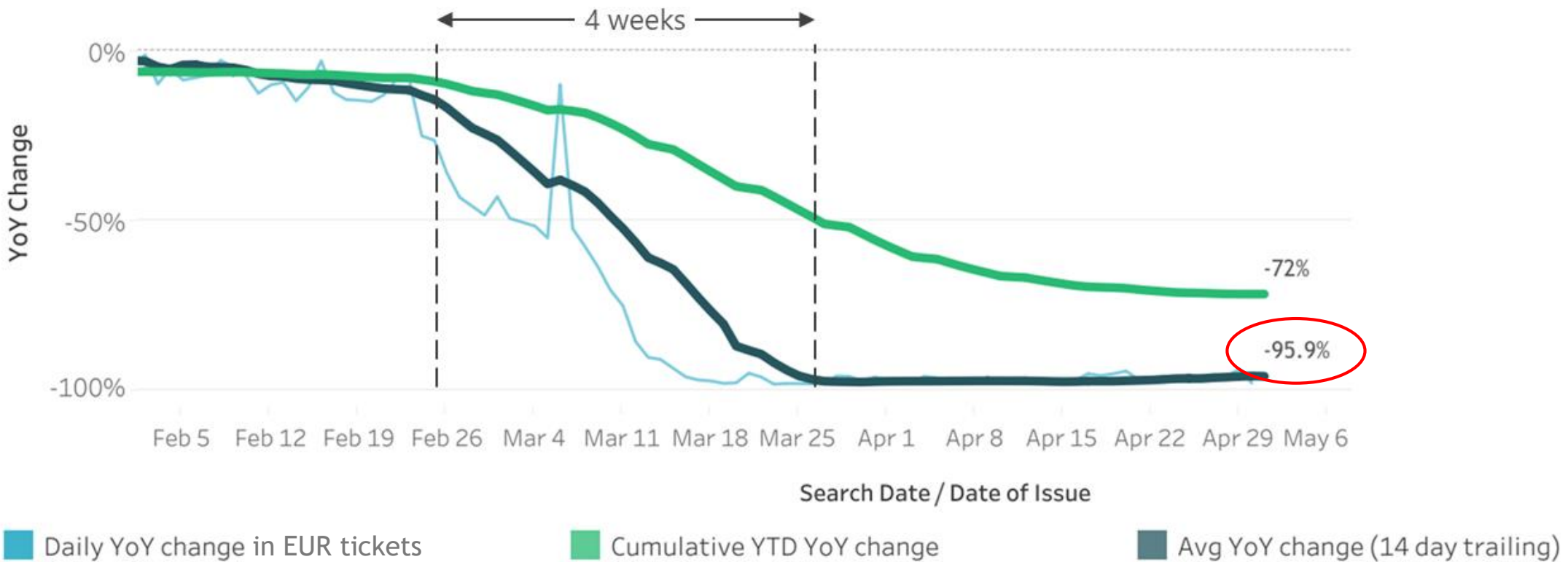


A resilient new normal

Sander Stomph - VP Operations Decision Support



Unprecedented COVID ramp-down underlines need for agility...

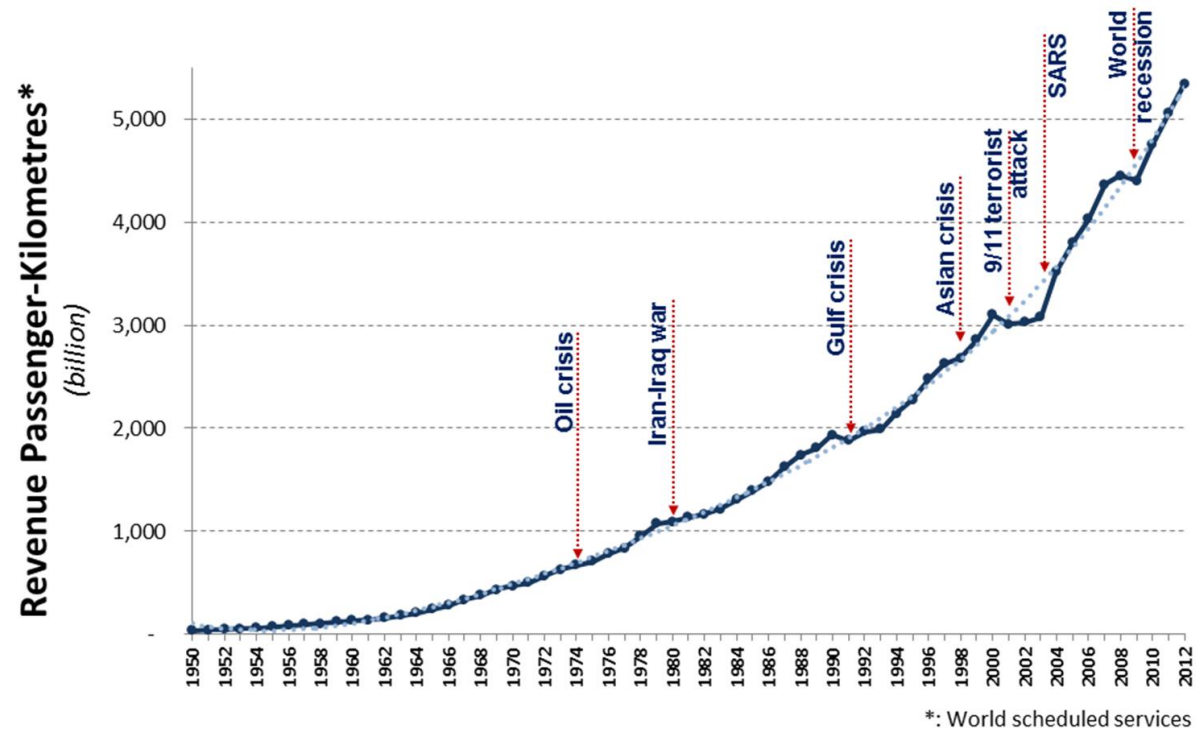


[1] Searched and ticketed nights shown for roundtrip trips only. [Notes] Sept+ includes all travel departing after Sept 1, 2020, up to 330 days after the last search/issue date. YTD data is updated per data sources below.

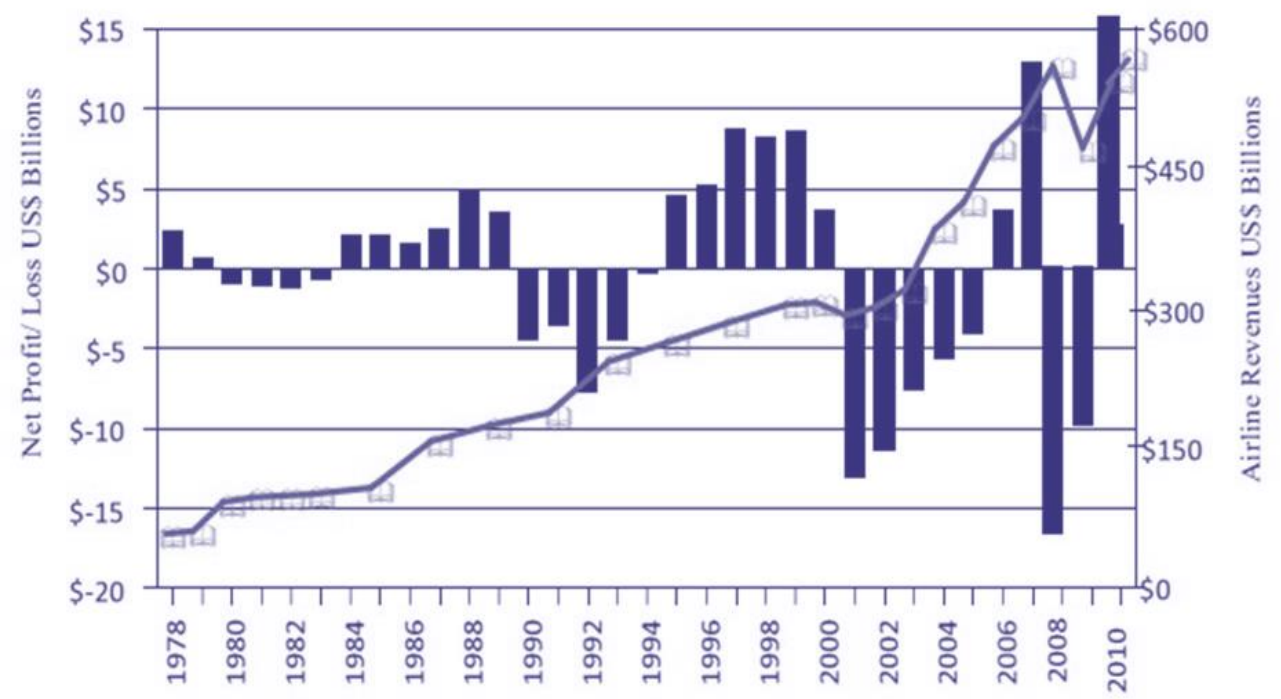


...in an industry susceptible to disruption and increasingly large shocks

World aviation (RPK's)



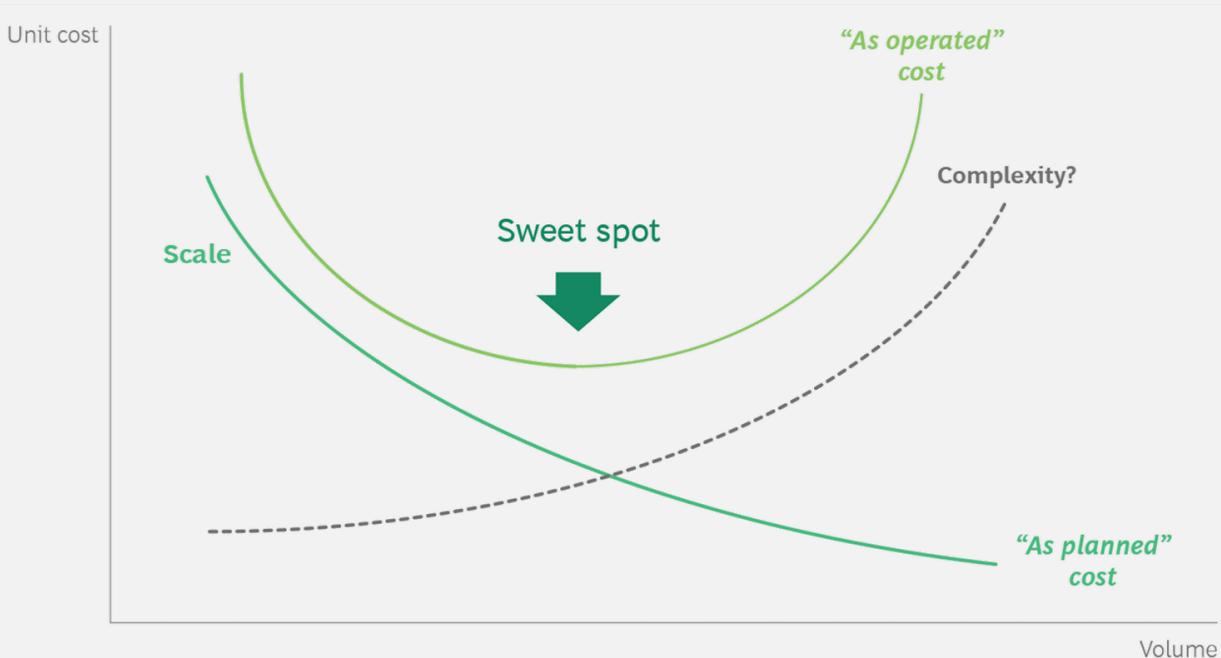
Commercial aviation (Net profit/loss)



Source: ICAO, IATA



Resilience is about **systems balance**, and finding new optimum – *fast*



Industry challenges

Silos

KPIs addressed in isolation, single department mentality in planning and execution, lack of feedback loops from OPSD to commercial planning, analytics spread by department, individual teams adding buffers

Lack of insights

Multiple data sources, meetings and reports merely focusing on averages or incidents, reinventing the wheel every day

System focus

Limited differentiation and testing, frontline staff with lack of information and empowerment to make decisions

Outdated IT

Software lost pace with growing complexity (multi-AOC, multi-hub etc.), lack of real intelligence/Optimization algorithms

Mindset

Focus of (digital) innovations in commercial areas, investments mostly in fleet, treating Operations as cost center

MAXIMIZE ROBUSTNESS MAXIMIZE UTILISATION, NOT DETERIORATING ROBUSTNESS MAXIMIZE UTILISATION, WITH POTENTIAL OTP REDUCTION



Focus on customer



Focus on utilisation



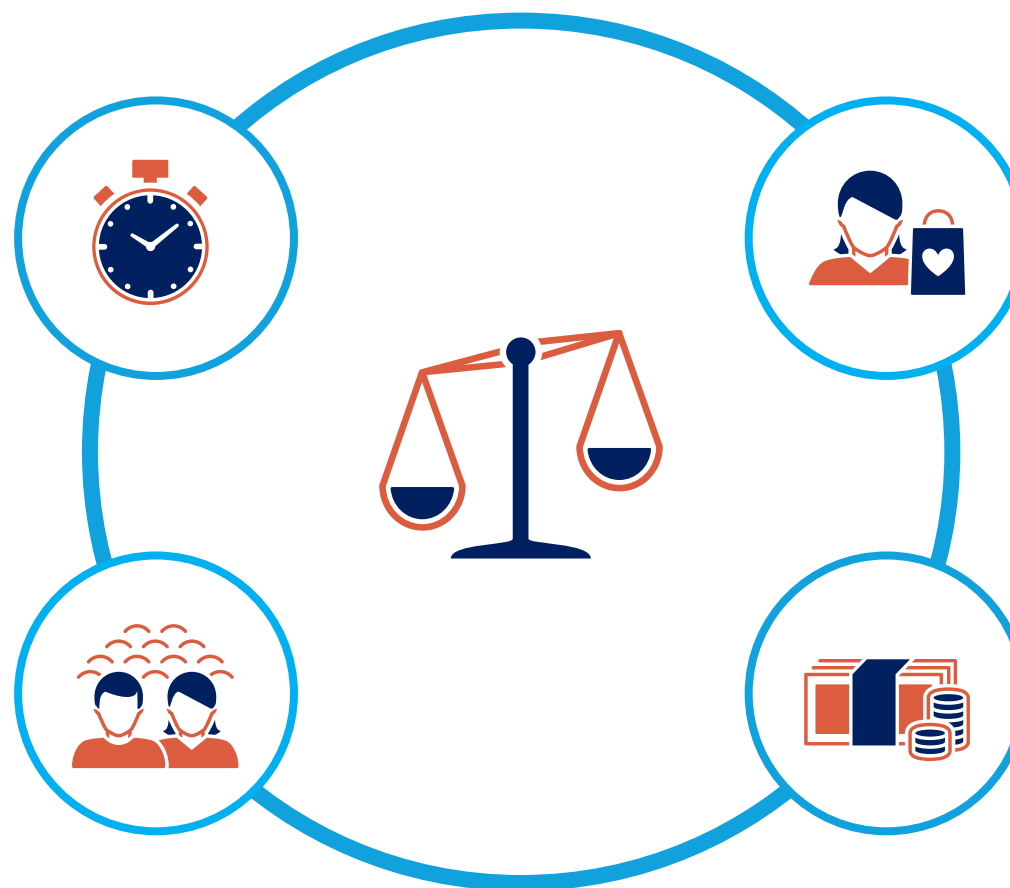
New normal: optimize system interdependency, not parts data & digital key enablers

PERFORMANCE

Optimizing profitability, improving on-time-performance, completion rate, bag loss rate, missed connections etc. (consistent with airline value proposition)

EMPLOYEE ENGAGEMENT

Improving resource utilization and productivity while improving crew satisfaction and engagement



CUSTOMER SATISFACTION

Delivering customer experience consistently at a high level of quality—digital and face-to-face

Clear and timely information provided to customers (particularly in times of disruption)

COST EFFICIENCY

Continuously looking for ways to achieve a lower cost structure (working internally and with unions) while also driving increased productivity



How we
changed the
performance
curve @KLM




Watch video **Bring AI to Life in airline operations**


airlineoperations.ai

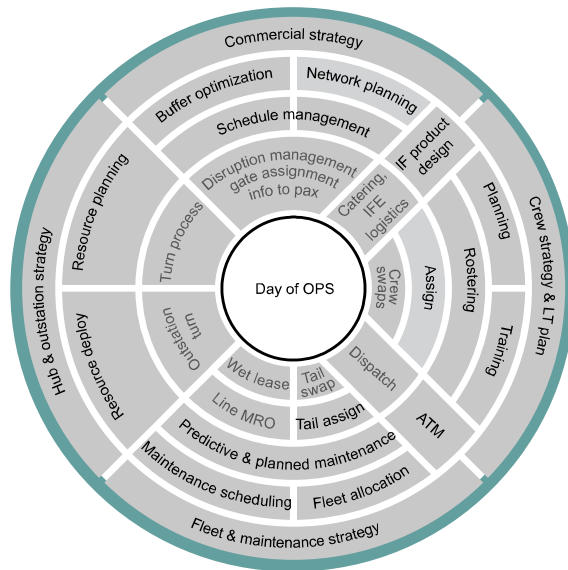



Vision to achieve integrated decision making across silos and planning horizons

WE APPLY A HOLISTIC FRAMEWORK...

 Commercial planning,
network and info to passengers

 Ground crew
& equipment



 Fleet and maintenance

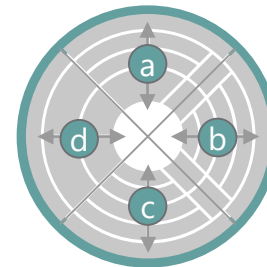
 Flight crew

... TO DRIVE INTEGRAL DECISION MAKING



Covering 3 planning cycle horizons including feedback loops between them

- 1) **Strategic:** ~12-4 months before Day of Operation
- 2) **Robustness:** ~3 months until day before DoO
- 3) **Execution, managing disruptions:** DoO

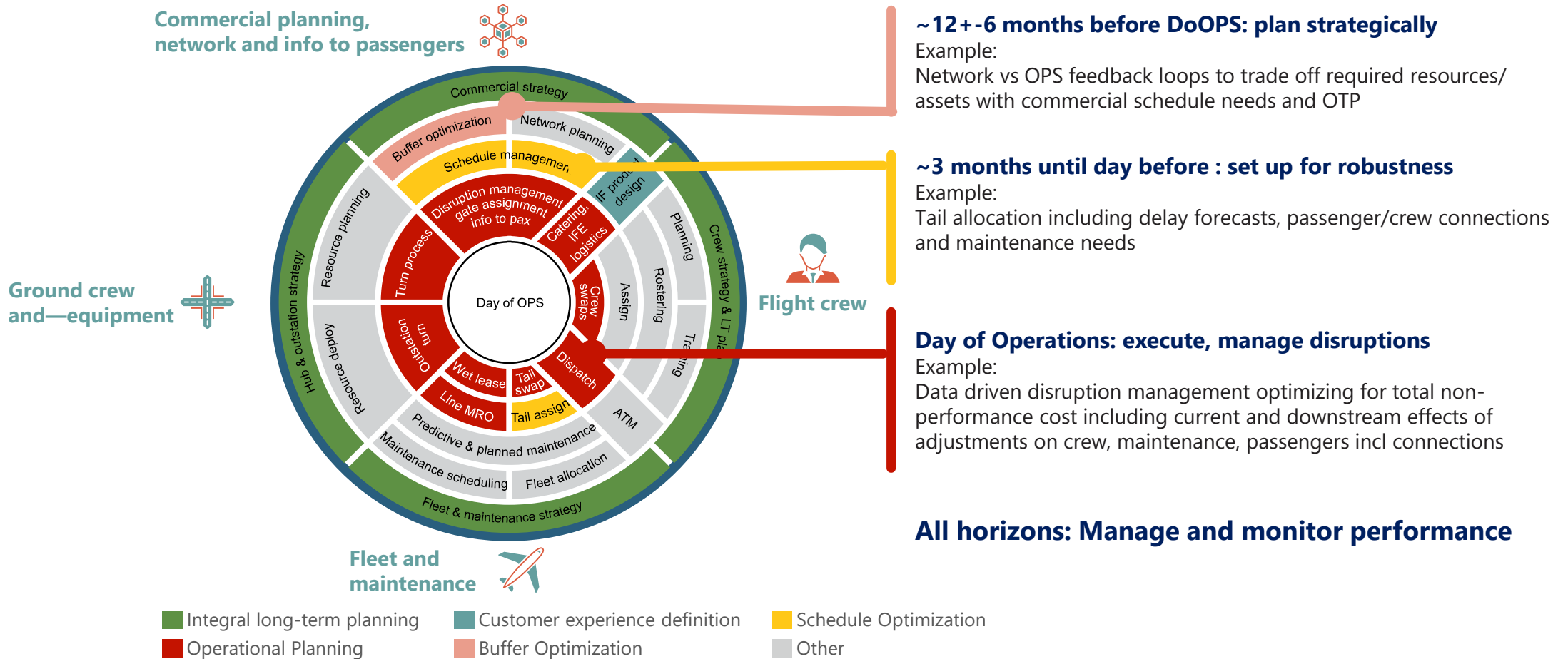


Covering all contributors needed to deliver every day, every flight

- a) Commercial planning, network and info to passengers
- b) Flight crew
- c) Fleet and maintenance
- d) Ground crew and equipment

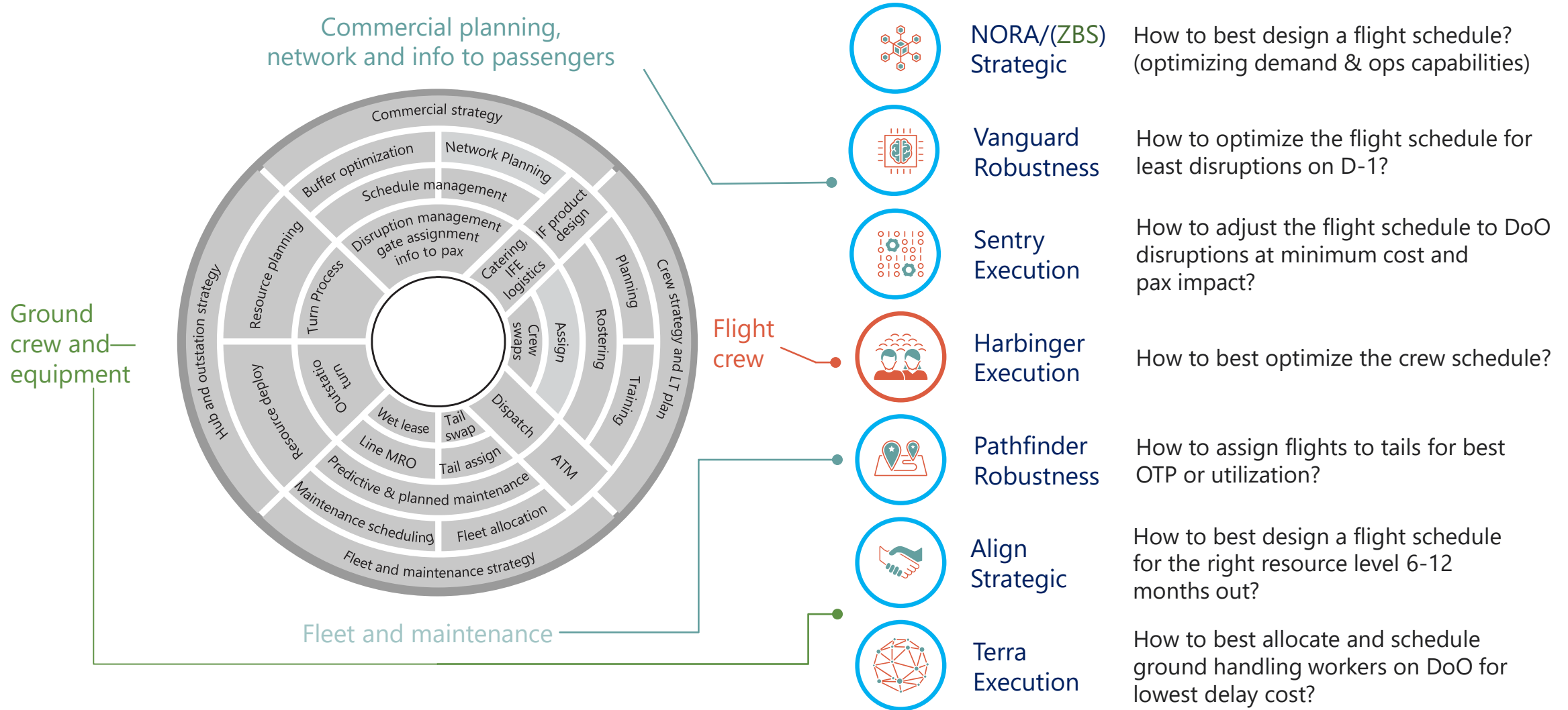


Integrated decision making across silos and planning cycles



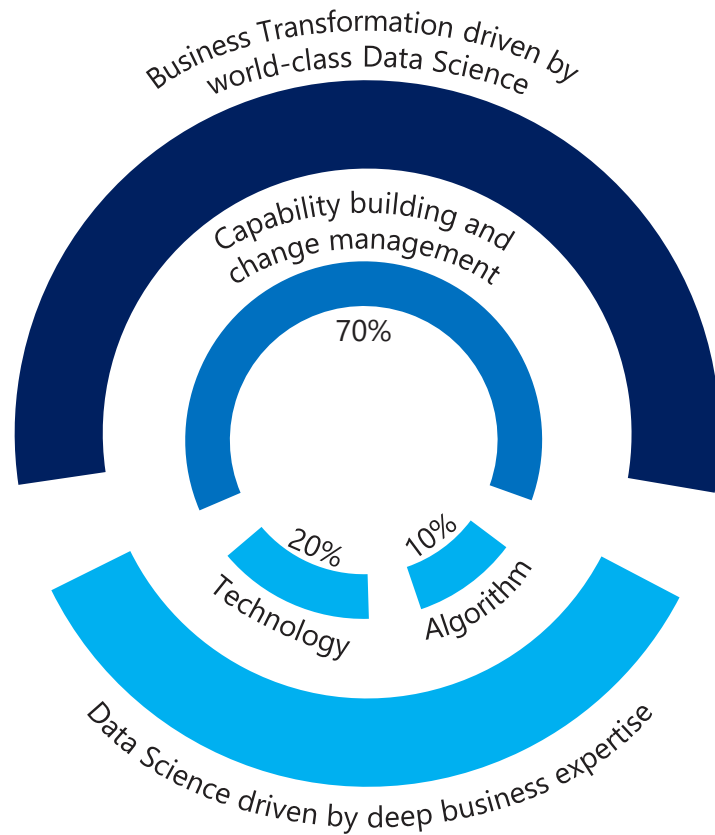


To achieve our vision, we built a suite of tools used in live operations





10 – 20 – 70 – the real value is in the business transformation



10% Algorithms

- Single source of truth driven by common logic layer to all tools
- Advanced optimization and machine learning techniques



20% Technology and IT

- Robust data grid with 99% up-time
- Industrialized tools working in live operations on top of and/or instead of legacy systems

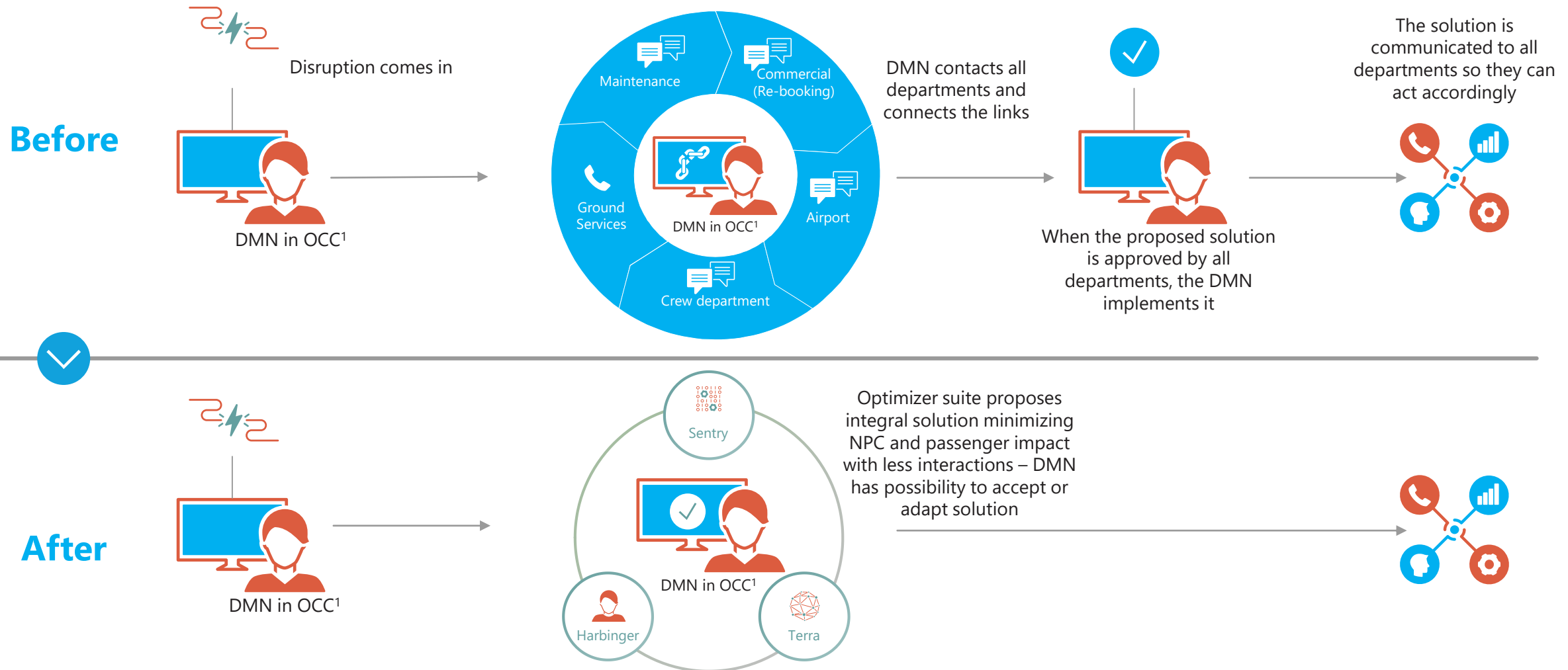


70% Business Transformation

- More accountability and transparency
- Better decisions, improved decision making processes, shifting responsibilities



Example DoO Disruption Management | Tool suite enables improved and faster disruption management by integral decision making

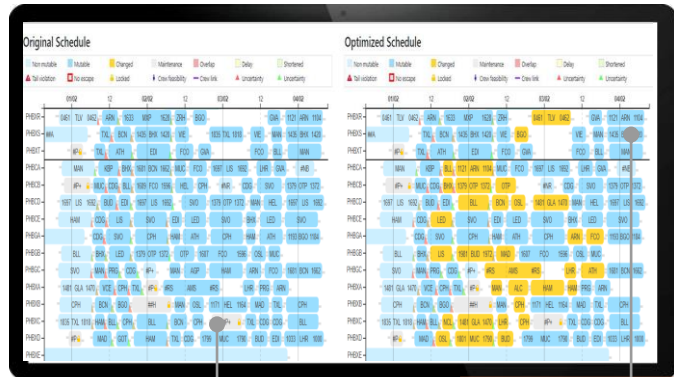


1. DMN = Duty Manager Network: in charge of operating the network on DoO; OCC = Operations Control Center



Pathfinder

Schedule optimization tool

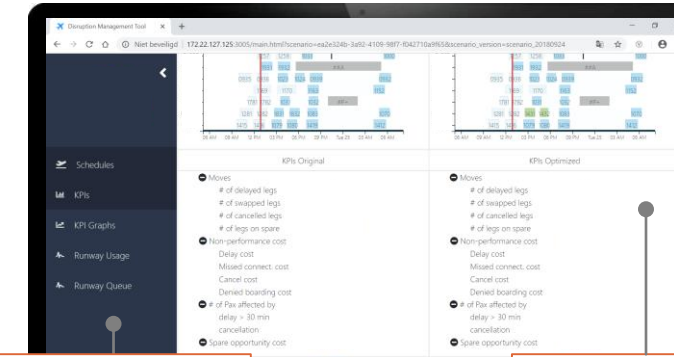


When creating fleet lines, tool takes mtx and fleet constraints into account

Tool changing a flight to another tail as there is a 20 minute delay predicted

Sentry

Flight Disruption Management



When changing flight times, taking max runway capacity, slots and airport opening times into account

Sentry calculates missed connections and associated costs based on flight level costs and connection input

PURPOSE

- Create fleet lines, allocate tails to fleet lines and optimize flight schedule either for robustness or for utilization
- Different objective functions can be used for different planning horizons or to create schedules under different scenario's

PURPOSE

- Based on disrupted flight schedule during DoE, Sentry proposes which flights to swap, delay, cancel or use spare A/C to minimize delay costs and maximize operational performance

 **KLM** Royal Dutch Airlines

www.airlineoperations.ai



Photo: Jennifer Renting



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WEBINAR SERIES

EPISODE 4 (BUILD RESILIENCE)



● **LIVE** PRESENTATION IN PROGRESS

Keynote: The new normal for operations post-COVID-19 crisis

Sander Stomph
VP Operations Decision Support, KLM

► TOOLS, TECH & ANALYTICS TO INCREASE RESILIENCE OF FLIGHT & AIRCRAFT OPS



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Partnering Now to Ensure Resilience During and After the Pandemic

21 May, 2020

The industry trusts us with its data and our aviation expertise

Trust

Outcomes

Differentiators

15,648
unique assets

46,689
years of flight data

56% ↓
unscheduled engine
removals for Emirates

\$ 18 MM
savings for a large
low cost carrier



Domain
100 years of
industry experience



458
airlines, military,
lessors relying on GE

1,000
engine events
avoided for Delta

8% ↑
mission readiness for
Colombian Air Force

Talent
700-strong
Digital team

Accelerators
collaboration centers
for digital discovery

801 MM
maintenance
record images

6,023
pilots optimizing ops
on FlightPulse

1% ↓
fuel cost for AirAsia

5.71 MM kg
of CO₂ saved by
Qantas pilots

Data Prep
saving data
scientists' time

Data Beliefs
you own your data

57,277
crew members on
Network Crew Opt.

8,932
aircraft sharing data
with EMS and FOQA

0
safety related events
at China Eastern



1,500 +
years of cumulative
data scientist exp'ce

Wingman
true partners on your
journey



Operational Costs Compound Quickly



Unplanned maintenance made up **27%** of all aircraft maintenance spending



Airline technicians spent **10.1 million** hours annually on unproductive tasks/management of records

Obsolete or damaged spares cost airlines over **\$3.6 billion**



Safety incidents cost **\$1 billion**

5% of all jet fuel consumption was excess

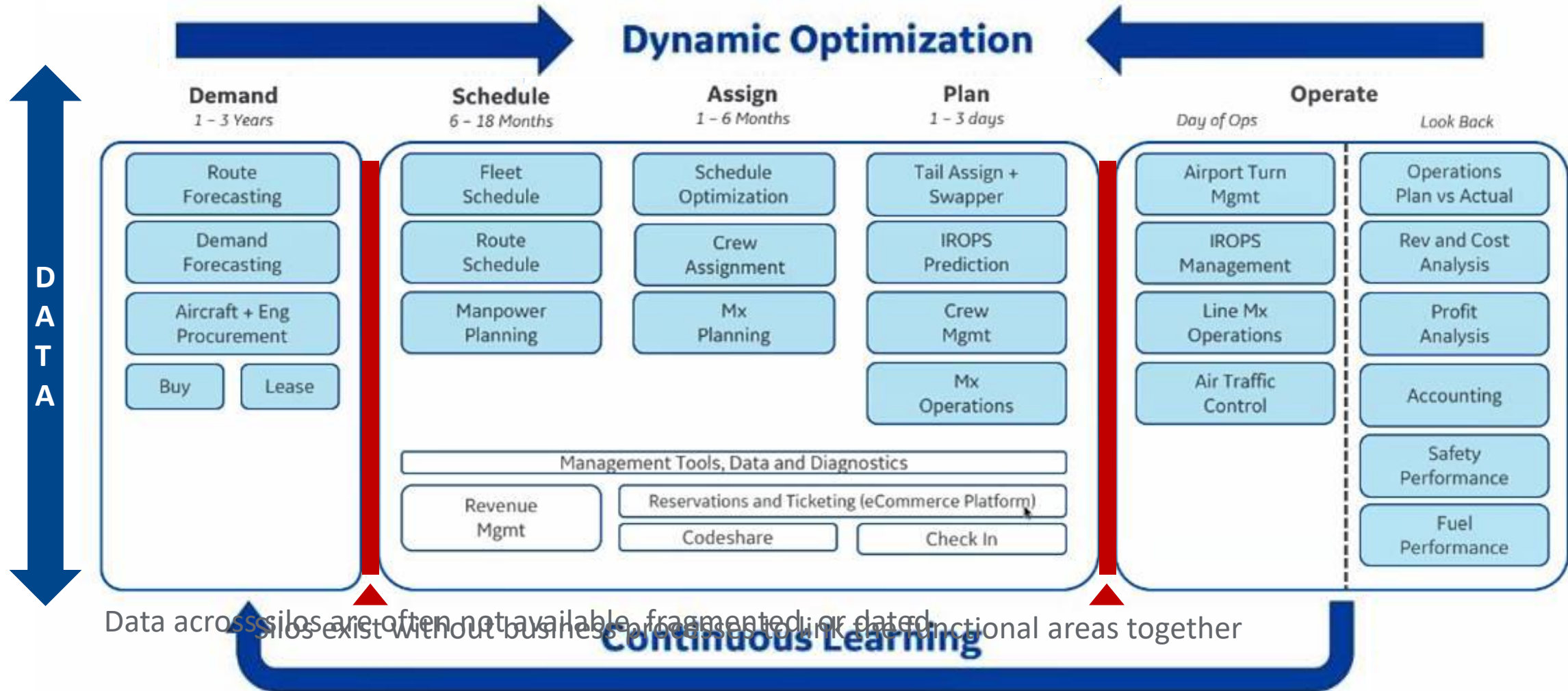


On-time performance was **81.5%** globally, with **5.6 million** flights delayed by more than **15 minutes**



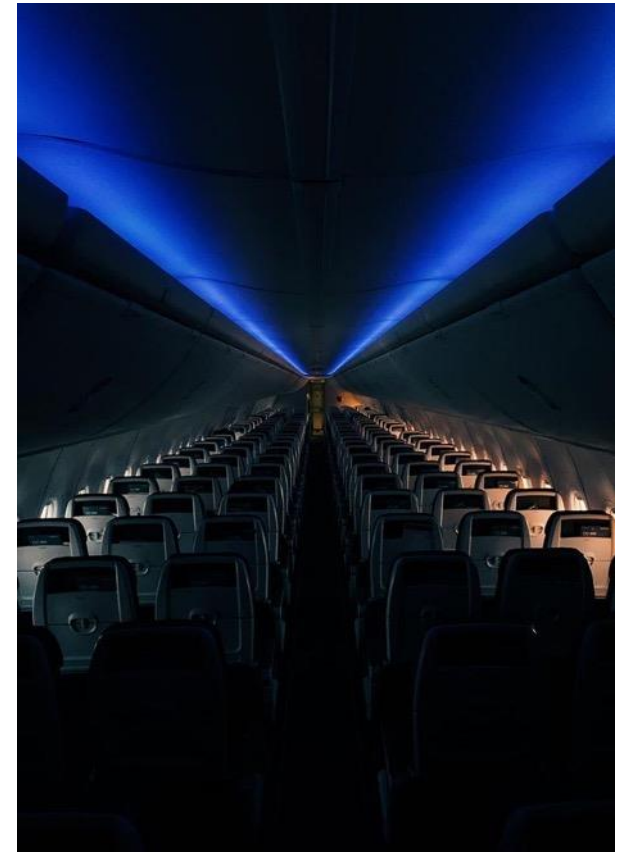
67 million meals wasted and **23.6 million** bags mishandled

Complex airline operations require near perfect execution to deliver on the day of ops



Challenges Compounded by COVID 19

- Global traffic **↓80% due** to COVID travel restrictions
- Continued market compression while COVID still active
- Negative customer sentiment - airports and airplanes are not safe
- Hygiene and sanitation requirements lead to **↑ turn times and ↓ asset utilization**
- **Reduced load factors** due to market demand and social distancing
- Decreased airline profitability leading to **tight cost controls**
- **Unpredictable demand**
- **Asset health concerns** due to prolonged shut down
- Maintaining **pilot currency** while rostering and recovering from disruption
- Balancing **passenger and cargo loads and routes** to maximize profitability
- **Dispositioning assets manually**



Utilize Artificial Intelligence to dynamically plan for uncertainty



Health Pass

project health pass for crew and passenger health certification

Tail Assignment

dynamically optimize tail assignment within 48 hours of flight

Asset Transfer

enable fully digital transition of aircraft quickly, and from anywhere in the world

Cabin Air Flow

monitoring the systems that provide clean cabin air

Crew

rapidly piece together broken crew pairings during dynamic operational environment

Fleet Efficiency

informing decisions on groundings, retirements, and route selection to maximize fuel efficiency

Schedule

protect seat spoilage and passenger spill with advance machine learning algorithms

Load and Route

passenger and cargo load and route balancing

Fuel Dashboard

analyze current fuel usage to identify savings opportunities



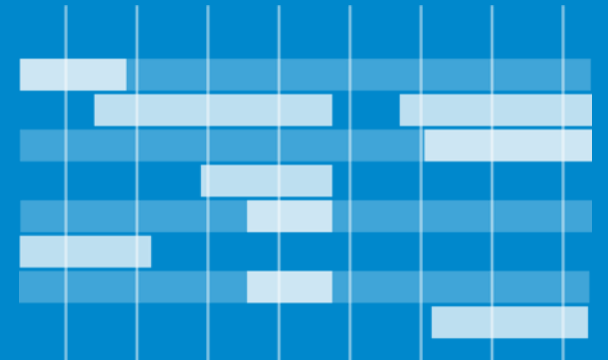
Now is the BEST time to build resilience into your operation by implementing ...



DIGITAL PLATFORM FOR
EFFICIENCY



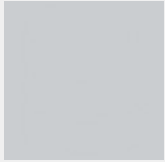
IMPROVED SCHEDULING
AND PLANNING PROCESSES



DIGITAL DISRUPTION
MANAGEMENT

Building resilience NOW into your operation by ...

Digital Platform



EFFICIENCY

Migrate to off-the-shelf platform for analytics. Platforms enables ...

- Data security
- Reduced cost of ownership
- Access to industry relevant data
- Simplified access to best in breed industry analytics
- Ease to build and protect your own analytics
- Historical and near real time data availability

Planning and Scheduling Processes

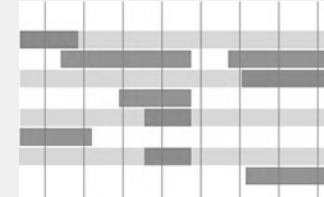


IMPROVE

Process improvement for planning and scheduling to execute day of operations as planned ...

- Accuracy of assumptions in the planning process
 - Ability to look at recent performance and modify schedule for day of ops
 - Actual performance available within a feedback loop
- Prioritization of engine maintenance items and identification of data outages

Digital Disruption Management



DETECTION

Instantly detect disrupted passengers and identify misconnections and cancellations.

- Operations system agnostic
- Speed and flexibility of recovery solutions
- Ops/Crew and Passenger Reflow
- Reduce OCC staff requirements with digital capabilities
- Complete implementation while operation has slowed due to pandemic

Connect with your GE CSM



The airline industry will return, and when it does...

Airlines

will be more resilient

Scheduling & Planning

processes will be more agile

Day of Operations

managed real-time

Digital Tools

driving agility, speed and connection of data across the operation

Platform

enabling cost efficiencies and improving passenger satisfaction



Thank You!

For more information, please visit ...

geaviation.com/business-continuity-solutions





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WEBINAR SERIES

EPISODE 4 (BUILD RESILIENCE)



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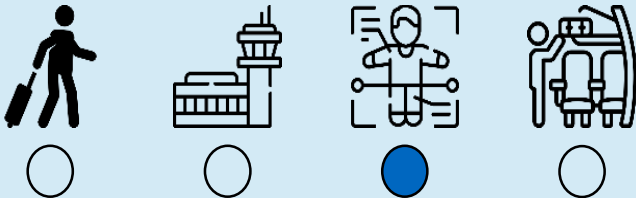
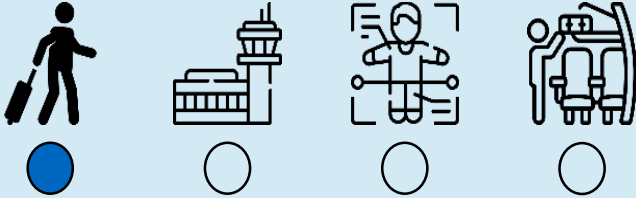
Duane Wehking
VP, Digital Solutions & Analytics, Boeing Global Services



The Role of Technology amidst a changed passenger experience

20 May, 2020

New Reality in Asia



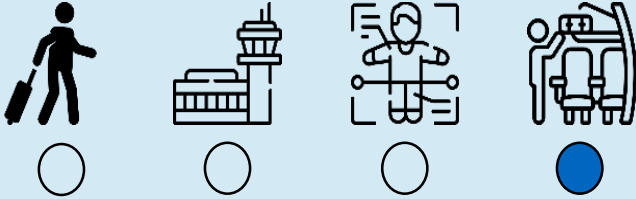
Arriving at the airport: Guangzhou Baiyun International Airport

- Scan your health code
- Temperature taken
 - Only Blue or Green (Good Health) codes allowed at entrance
- Before boarding, each passenger receives a card and must:
 - Self report temperature
 - List their health condition
 - List close contacts

Inside the Airport – Airport security

- Passengers need to remove caps, turbans etc. for temperature screening

New Reality in Asia



Civil Aviation Administration of China (CAAC) Preventing Spread of Coronavirus Disease 2019 (COVID-19) Guideline for Airlines (4. Edition) includes classification of Flight Risk Levels:

Low, Medium, or High:

- Epidemic development at the points of origin of flight
- Existence of High-efficiency Particulate Air (HEPA) filters
- Load factors
- Flight Times
- Special nature of the flight mission

Low Risk Flights

- Normal meal service provided; cold dishes and ice should be cancelled
- Lavatory cleaned every 2 hours
- Last three rows of seats on international flights reserved as a quarantine area

High Risk Flights

- Only provide necessary in-flight service
- Provide pre-packaged food and bottled waters
- Lavatory cleaned every hour
- Efforts should be made to arrange passengers to sit separately



Airline Operations

- ➔ Manage constantly changing schedules
- ➔ Route profitability analysis
- ➔ Flight plans efficiency on short hauls
- ➔ Flight analytics on short haul ops

Technology Solutions Available

- ✓ Address long & unpredictable turns
- ✓ Manage constant replanning, tail swapping
- ✓ No runway capacity limits/slots / no holdings
- ✓ Checks & MX possible at gate

Cabin Cleaning/ Mx Planning

- ➔ Planes disinfected daily
- ➔ Social distancing lead to every 2nd row available (max 75%)
- ➔ Long complicated boarding times

Technology Solutions Available

- ✓ MEL + tail mgmt, efficiency tools for ops
- ✓ Customer convenience tools
- ✓ Furlough crew need retraining

Crew Management

- ➔ Rules for crew
- ➔ Scheduling rules based on consistent crews
- ➔ Long complicated boarding times

Technology Solutions Available

- ✓ Manage constantly changing schedules
- ✓ Crew and fleet scheduling analysis
- ✓ Fatigue factors considered



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Audience: Live Poll Given current challenges & assuming appropriate safeguards are in place would you share your company data with peers/suppliers?



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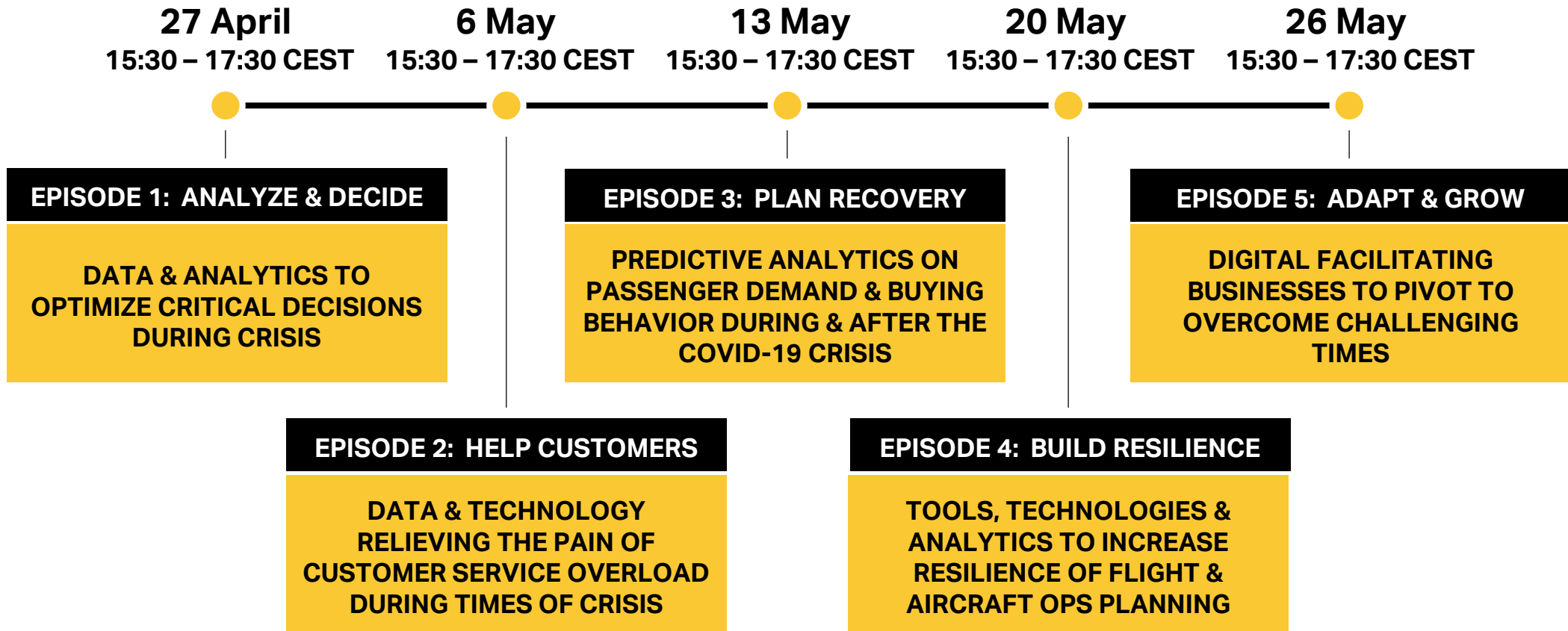


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Aviation Data & Digital Webinar Series



For more information & Registration go to:

iata.org/addws



Thank you, and see you soon!